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Annual INTEC Water Monitoring Report for Group 4—Perched Water (2005)

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ABSTRACT

This report summarizes 2005 monitoring activities and laboratory results for perched water sampling at the Idaho Nuclear Technology and Engineering Center (INTEC).

Water levels were measured in perched monitoring wells to evaluate the extent of perched water, and potential recharge sources at INTEC. Perched water beneath the northern part of INTEC has persisted during 2002-2005, in spite of the drought during that time. A combination of precipitation (rainfall and snowmelt) and discharges and leaks of water from facility pipelines appears to account for continued recharge of the perched water beneath the northern part of INTEC. A detailed analysis of shallow perched water level fluctuations indicates that the combined recharge from precipitation infiltration and leakage from INTEC pipelines is more important than Big Lost River streamflow infiltration with respect to contaminant transport in the shallow perched water beneath the tank farm area.

Perched water samples collected from 23 wells and 21 suction lysimeters were analyzed for a suite of radionuclides and inorganic constituents. Laboratory results in this report are compared to drinking water maximum contaminant levels (MCLs). Such comparison is for reference only and does not imply that the perched water zones constitute aquifers capable of sustained long-term yield. Moreover, the Operable Unit 3-13 Record of Decision does not require that perched water comply with drinking water standards.

Strontium-90, and to a lesser extent cesium-137, iodine-129, and tritium, were the radionuclides detected in perched water at concentrations exceeding their respective MCLs. Strontium-90 concentrations exceeded the MCL of 8 pCi/L in 16 of the 23 perched wells sampled, with shallow perched well MW-2 displaying the highest Sr-90 activity (188,000 pCi/L). Cs-137 was detected in a single well (33-1) at a concentration of 617 pCi/L, which exceeds the MCL of 200 pCi/L. Tritium concentrations slightly exceeded the MCL of 20,000 pCi/L in two of the wells. Iodine-129 slightly exceeded the MCL at one well near the tank farm. Technetium-99 was detected in several perched wells, but the concentrations did not exceed the MCL. Other radionuclides detected in one or more perched water samples at concentrations below the MCLs include U-233/234, U-235, and U-238. Nitrate concentrations exceeding the MCL were observed in several shallow and deep perched wells at INTEC.

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ACRONYMS

BLR	Big Lost River
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CS	Central Set
DOE	Department of Energy
DQO	data quality objective
EC	electrical conductivity
FFA/CO	Federal Facility Agreement and Consent Order
GEL	General Engineering Laboratories, LLC
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
MCL	maximum contaminant level
MDA	minimum detectable activity
MSIP	Monitoring System and Installation Plan
MWTS	Monitoring Well and Tracer Study
OU	operable unit
PE	performance evaluation
PP	Percolation Pond Set
ROD	Record of Decision
STL	sewage treatment lagoon
SRPA	Snake River Plain Aquifer
TF	Tank Farm Set
WAG	waste area group

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1. INTRODUCTION

This report summarizes 2005 perched water monitoring results for the Idaho Nuclear Technology and Engineering Center (INTEC). Data in this report include water level measurements and laboratory results for perched water samples collected from February through May 2005 to support the Waste Area Group (WAG) 3, Operable Unit (OU) 3-13, Group 4–Perched Water monitoring program. The OU 3-13 Record of Decision (ROD) requires that perched water zones be monitored to assess water drain out and downward contaminant flux to the Snake River Plain Aquifer (SRPA) (DOE-ID 1999). In addition, the *Long-Term Monitoring Plan for OU 3-13, Group 4 Perched Water* (DOE-ID 2004a) specifies the wells to be sampled, as well as the required field and laboratory parameters, based on the requirements in the ROD (DOE-ID 1999). The data quality objectives (DQOs) for the groundwater sampling are described in the Monitoring System and Installation Plan (MSIP) for Group 4 (DOE-ID 2005).

A comprehensive report, entitled *Phase I Monitoring Well and Tracer Study Report for OU 3-13, Group 4 Perched* (MWTS) (DOE-ID 2003a), summarized perched water monitoring data collected up to August 2002, including perched water quality results, vadose zone stratigraphy, geotechnical results, alluvium and interbed geochemistry, tracer test results, well completion reports, and hydrogeologic conceptual models. Perched water monitoring results for the previous year (2004) were published in the *Annual INTEC Water Monitoring Report for Group 4–Perched Water (2004)* (DOE-NE-ID 2004). In addition to the annual perched water monitoring reports, the Geochemical Study for Perched Water Source Identification (EDF-5758) published the results of laboratory analyses performed on perched water samples collected during 2003-2004.

1.1 Regulatory Background

The Idaho National Laboratory (INL) is divided into 10 WAGs to manage environmental operations mandated under the *Federal Facility Agreement and Consent Order* (FFA/CO) (DOE-ID 1991). INTEC, formerly the Idaho Chemical Processing Plant, is designated as WAG 3. Operable Unit 3-13 encompasses the entire INTEC facility.

In October 1999, the ROD was issued for OU 3-13 (DOE-ID 1999) and specifies remedial actions for the INTEC perched water (Group 4) and groundwater (Group 5). The remedy selected for perched water (Group 4) is institutional controls with aquifer recharge controls (DOE-ID 1999). Specific tasks called out in the ROD to control surface water recharge to perched water beneath INTEC were

- Relocate percolation ponds (away from INTEC) by December 2003
- Minimize recharge to the perched water from lawn irrigation (if necessary)
- Line Big Lost River (BLR) channel segment (if necessary)
- Implement additional infiltration controls if drainout of perched water does not occur within 5 years of removing the percolation ponds (Phase II to Group 4 remedy)
- Measure moisture content and contaminant of concern concentration(s) in the perched water zones to determine if water contents and contaminant fluxes are decreasing as predicted.

As of the end of 2004, activities completed to implement the remedy and reduce recharge include

- Percolation ponds permanently taken out of service on August 26, 2002, reducing water infiltration at INTEC by ~1 mgd.
- Sewage effluent redirected to new percolation ponds on December 2, 2004, reducing infiltration by ~40,000 gpd.
- Tank Farm Interim Action project installed concrete-lined ditches around the tank farm to reduce water infiltration (2003-2004).
- Subsurface injection of steam condensate was reduced from ~2,013 gpd (1997) to ~80 gpd (2003).
- Lawn irrigation reduced through elimination of some grassed lawn areas.

Additional efforts are now underway and/or being evaluated to further reduce recharge to the perched water and the aquifer, including

- Testing of underground pipelines to locate and eliminate water leaks
- Eliminating clean water discharges to ground inside the INTEC fence
- Cement lining of additional ditches at INTEC to reduce storm water infiltration that impact perched water.

1.2 Site Background

The INL Site is a government-owned facility managed by DOE and is located 52 km (32 mi) west of Idaho Falls, Idaho. It occupies approximately 2,305 km^2 (890 mi^2) of the northwestern portion of the Eastern Snake River Plain in southeast Idaho, and the INTEC facility includes an area of approximately 0.39 km^2 (0.15 mi^2) in the south-central area of the INL (Figure A-1). (All figures are provided in Appendix A.)

In operation since 1952, INTEC stored and reprocessed spent nuclear fuel to recover fissile uranium. DOE phased out the reprocessing operations in 1992 and redirected INTEC's mission to include (1) receipt and temporary storage of spent nuclear fuel and other radioactive wastes for future disposition, (2) management of current and past wastes, and (3) performance of remedial actions.

Liquid wastes generated from past activities were stored in underground stainless-steel tanks at the INTEC tank farm. Numerous Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) sites are located at and near the tank farm and adjacent to the process equipment waste evaporator. Contaminants found in soils at the tank farm are the result of accidental releases and leaks from process piping, valve boxes, and sumps. There is no evidence indicating that the waste tanks have leaked. Contaminated soils at the tank farm compose about 95% of the known contaminant inventory at INTEC. The Comprehensive Remedial Investigation/Feasibility Study for OU 3-13 (DOE-ID 1997a, 1997b, 1998) and the OU 3-14 Remedial Investigation/Feasibility Study Work Plan (DOE-ID 2004b) contain detailed discussions of the nature and extent of contamination. The nature and extent of contaminants in the alluvium underlying the tank farm are currently being investigated as part of the OU 3-14 remedial investigation (DOE-ID 2004b).

1.3 Environmental Setting

The land surface at INTEC is relatively flat, with an average elevation of 1,498 m (4,914 ft) above mean sea level. Mean annual precipitation in the vicinity of INTEC is approximately 22.1 cm/yr (8.7 in./yr), and approximately 30% of total precipitation occurs as snowfall (DOE-ID 1989). The BLR, an intermittent stream located adjacent to the northwest corner of INTEC (Figure A-2), constitutes a significant source of recharge to perched water and the aquifer. Flow in the BLR adjacent to INTEC depends on winter snowpack conditions and the magnitude and duration of controlled releases from Mackay Reservoir. When the BLR does flow onto the INL Site, much of the water infiltrates and eventually recharges the SRPA, which lies at a depth of approximately 137 m (450 ft) below ground surface (bgs) at INTEC.

Perched water zones exist at various depths within the 137-m (450-ft) -thick vadose zone beneath INTEC. Recharge sources to these perched water zones include (1) infiltration of water beneath the BLR channel, (2) infiltration of rain and snowmelt, (3) water losses from the INTEC raw water and potable water distribution systems, and (4) infiltration from lawn irrigation. Past recharge sources that no longer exist include (1) service wastewater discharges from the former INTEC injection well (ceased in 1986), (2) infiltration of service wastewater from the former percolation ponds (Figure A-2) located near the southern boundary of INTEC (discharges ceased in August 2002), and (3) infiltration of treated wastewater effluent at the former Sewage Treatment Plant infiltration galleries (discharges ceased in December 2004).

1.4 Monitoring Wells Installed in 2005

To better define the distribution of Tc-99 and other contaminants in perched water and the aquifer, several new monitoring wells were installed at INTEC during 2005 (Figure A-2), including

- Two shallow perched wells: ICPP-2018 (TFS-SP) and ICPP-2019 (TFSE-SP)
- Two deep perched wells: ICPP-2020 (TFS-DP) and ICPP-2021 (TFSE-DP)
- Two aquifer wells: ICPP-2020 (TFS-AQ) and ICPP-2021 (TFSE-AQ).

Wells were installed in accordance with the *INTEC 2005 Monitoring Well Installation Plan* (DOE-NE-ID 2005). The two upper shallow perched wells (ICPP-2018 and ICPP-2019) are separate monitoring wells, while the remaining wells are dual-completion wells (deep perched and aquifer) in a single borehole. Completion diagrams for the new monitoring wells are included in Appendix G.

1.5 Document Organization

Section 2 presents the results of perched water monitoring at INTEC during FY 2005, and Section 3 provides a summary and conclusions based on these results. Figures and tables can be found in Appendixes A and B, respectively. An evaluation of factors affecting perched water levels at INTEC is included Appendix C. Perched water hydrographs are included in Appendix D, and Appendix E contains perched water temperature and electrical conductivity plots. Appendix F contains graphs of tensiometer data, and well completion diagrams for new monitoring wells installed at INTEC during 2005 can be found in Appendix G.

2. MONITORING PROGRAM AND RESULTS

For the period of this report, WAG 3, Group 4, monitoring activities consisted of perched water sampling, manual perched water level measurements, automated (data logger) perched water level measurements, and automated tensiometer water potential measurements. Perched water samples were collected from February 1-March 2, 2005, and from May 10-19, 2005. The two sampling events were timed to allow for well maintenance and for the potential rewetting of dry wells from spring snowmelt. In addition to the two primary sampling events, perched water samples were also collected on other dates at particular locations. As a result of the sudden occurrence of water in perched monitoring well MW-15 in August 2004, a special sampling event was performed at this location on October 11, 2004. New shallow perched monitoring wells ICPP-2018 (TFS-SP) and -2019 (TFSE-SP) were sampled on April 19, 2005, immediately following their installation. Vadose zone water samples were collected from suction lysimeters on March 1, 2005, and May 23, 2005. Table B-1 lists the sample dates for each well.

Manual perched water level measurements were recorded monthly during 2005. In addition, selected perched monitoring wells were equipped with pressure transducers and data loggers that recorded water levels every 30 minutes (if the well contained water). The data loggers were downloaded quarterly. Due to above-normal precipitation, the BLR flowed briefly past INTEC during May 29-June 8, 2005. In accordance with OU 3-13, Group 4, requirements and Agency request, a particular effort was made to assess the effect of BLR flow on perched water levels. The perched water sampling results, water level data, and tensiometer data are described in the following sections.

2.1 Perched Groundwater Sampling Laboratory Results

Perched water samples were collected from 23 perched wells (Figure A-2) and 21 suction lysimeters (Figure A-3). Samples were not obtained from some wells, either because these wells were dry or because the water level did not recover sufficiently following purging (next business day) to collect the required sample volumes. In cases where lack of water precluded collection of the entire sample volume, only a partial suite of laboratory analyses was performed. Table B-1 summarizes which wells were sampled and for which laboratory analytes. (All tables are provided in Appendix B.)

At those wells where sufficient water was available, perched water samples were analyzed for tritium, Sr-90, I-129, Tc-99, uranium isotopes, plutonium isotopes, americium-241 (Am-241), neptunium-237 (Np-237), gamma-emitting radionuclides (including Cs-137), metals (filtered and unfiltered), and selected anions. Spatial distribution of primary radionuclide contaminants (Sr-90, Tc-99, tritium, and I-129) is shown in Figures A-4 to A-7, and nonradionuclide contaminants (nitrate and chloride) are shown in Figures A-8 and A-9. Field parameters measured immediately prior to sample collection are reported in Table B-2, including pH, water temperature, electrical conductivity (EC), and dissolved oxygen. Radionuclide results for perched water samples are summarized in Table B-3. Table B-4 summarizes the results for nonradioactive inorganic constituents.

Complete laboratory results are given on a data CD, which is included with this document. Radionuclide concentrations (activities) are shown without the associated analytical uncertainties throughout the text of this report. However, consideration of analytical uncertainties is important when evaluating radionuclide results, and the reader is referred to the tabulated data for the uncertainties associated with each sample (see Appendix B and attached CD).

Perched water results in this report are compared to drinking water maximum contaminant levels (MCLs). Such comparison is for reference only and does not imply that the perched water zones constitute aquifers capable of sustained long-term yield or consumption. Moreover, although the OU 3-13

ROD (DOE-ID 1999) does not require that perched water comply with MCLs, it does require that contaminant fluxes from the vadose zone be reduced so that the SRPA meets MCLs after 2095.

Laboratory analyses for radionuclides and metals were performed by General Engineering Laboratories, LLC, (GEL) in Charleston, South Carolina. Other inorganic constituents were analyzed by Southwest Research Institute in San Antonio, Texas. Level A data validation was performed on all laboratory results. To assess analytical performance for key radionuclides, double-blind aqueous performance evaluation (PE) samples prepared by the Radiological and Environmental Sciences Laboratory were submitted to the off-Site laboratory (GEL) with the May 2005 perched water samples. The PE samples contained known concentrations (activities) of selected radionuclides, including tritium, Am-241, Cs-137, I-129, Pu-238, Pu-239, Sr-90, Tc-99, U-234, and U-238, among others. The Radiological and Environmental Sciences Laboratory and the Sample and Analysis Management Program performed an assessment of the results reported by the off-Site laboratory. With the exception of U-234 and I-129, all other results met the acceptance criteria, indicating that the off-Site laboratory results were in agreement with the known concentrations. However, the U-234 results were judged as not acceptable because the calculated mean difference values and laboratory/reference value ratios were not within the acceptance range (off-Site lab result biased high: +5.2 sigma; 116% recovery). The result for I-129 was not acceptable because the off-Site laboratory reported a nondetect (-0.015 ± -0.04 pCi/L), when activity was actually present in the PE sample (1.02 ± 0.02 pCi/L). The reason for the poor laboratory performance for the I-129 analysis is being investigated, and a copy of the PE sample results was sent to the off-Site laboratory. Furthermore, several additional blind and double-blind PE samples were submitted to the off-Site laboratory (GEL) during September 2005 in an attempt to elucidate the cause of the poor performance for the I-129 PE sample analysis.

The following sections discuss the 2005 water quality results for the northern and southern perched water zones.

2.1.1 Northern Shallow Perched Water Results

The northern shallow perched water consists of two perched water zones: upper shallow and lower shallow. The upper shallow perched water zone corresponds with the sedimentary interbed at approximately 33.5 m (110 ft) bgs, and the lower shallow perched water zone corresponds with the interbed at approximately 42 m (140 ft) bgs. During the 2005 reporting period, the following wells completed in the northern shallow perched zones were sampled: 33-1, 33-2, 33-3, 33-4-1, 37-4, 55-06, BLR-CH, MW-2, MW-5-2, MW-6, MW-10-2, MW-20-2, TF-CH, ICPP-2018, and ICPP-2019.

Field parameter results are summarized in Table B-2. Shallow perched water pH values ranged from 7.1 (MW-5-2) to 8.38 (BLR-CH). EC values for the majority of shallow perched wells were in the range of 0.3 to 1.0 mS/cm. However, as in previous years, well 33-3 (located near the northwest corner of the tank farm) had a much higher EC (8.69 mS/cm) than the other wells. The elevated EC in well 33-3 corresponds with unusually high sodium and chloride concentrations that are believed to be associated with leakage of brine from the nearby brine pit (CPP-736) and/or associated piping (EDF-5758).

Sr-90 was detected in all of the INTEC perched water wells, and, as in the past, very high Sr-90 levels (>10,000 pCi/L) were observed in the northern shallow perched water across INTEC. Figure A-4 shows the distribution of Sr-90 in perched water. Sixteen of the 23 perched wells sampled during 2005 exceeded the Sr-90 MCL of 8 pCi/L. The highest Sr-90 concentrations were observed in wells southeast of the tank farm. The maximum Sr-90 concentrations detected were 188,000 pCi/L (MW-2), 159,000 pCi/L (33-1), 127,000 (ICPP-2018), 62,500 (MW-5-2), 36,500 (ICPP-2019), and 19,500 pCi/L (55-06). MW-20-2 and MW-10-2, completed in the lower shallow perched zone, also contained elevated Sr-90 at 19,500 and 13,100 pCi/L, respectively.

Figure A-10 shows the Sr-90 trend over time in wells that have historically contained the highest concentrations (MW-2, MW-5-2, and 55-06). Sr-90 concentrations observed in 2005 are approximately half those reported in these same wells during the mid-1990s. Given its 29-year half-life, only a portion of the observed decline of Sr-90 concentrations can be attributed to radioactive decay; the remainder must be the result of other attenuation processes, such as adsorption, advection, and dilution/dispersion.

In the northern shallow perched wells, Sr-90 concentrations were similar to those observed in 2004 in most of the wells (DOE-NE-ID 2004), exceptions being MW-6 and MW-5-2. In MW-6, the 2004 Sr-90 concentration (8,100 pCi/L) was much higher than that observed in 2003 (19.2 pCi/L) or 2005 (1.04 pCi/L). The 2004 gross beta activity was also elevated (14,900 pCi/L). The reason for these anomalous results has not been unequivocally determined; however, they may be attributable to a lab error or sample labeling mixup. This hypothesis is supported by the fact that, except for 2004, MW-6 has never had Sr-90 concentrations that exceeded 20 pCi/L. Otherwise, it is difficult to envision how concentrations could have risen, then fallen, so dramatically between 2003 and 2005.

In well MW-5-2 (located at the southern edge of the Waste Calcining Facility cap) the Sr-90 concentration in 2005 (61,200 pCi/L) was nearly four times higher than in 2004 (16,100 pCi/L) and 2003 (19,000 pCi/L). The trend of increasing Sr-90 concentrations at this location (Figure A-10) appears to be real, as the field duplicate results were similar, and the gross beta results confirm the Sr-90 values (Table B-3). The EC at this well was also elevated in 2005 (0.87 mS/cm), as compared to 2004 (0.50 mS/cm), indicating that the salinity of perched water had increased over this period. A downhole EC and temperature sensor installed in MW-5-2 shows that the perched water at this location had a dramatic increase in salinity, as well as a significant temperature increase, during the last half of 2004 (Appendix E). This anomaly follows a 10-ft increase in perched water levels that peaked in March 2004, followed by a 12-ft decline in water level during 2004-05 (Appendix D). The cause(s) of the large fluctuations in water level and perched water quality at MW-5-2 has not been conclusively determined. However, an underground steam line leak not far south of this well (near CPP-1608) may be at least partially responsible. According to Terry Chesnovar,[a] the underground steam lines serving CPP-665 and CPP-1608 were isolated (shut off) during late 2004 to eliminate a steam leakage from the line that began an unknown time prior to that. The exact location of the steam leak(s) has never been determined but is likely less than 300 ft south of MW-5-2. Notably, downhole logging with the colloidal borescope at this well during November 2004 suggested rapid northward flow of the shallow perched water at this location. This observation would be consistent with a recharge source to the south of the well, possibly leakage of steam or steam condensate. The elevated Sr-90 and beta activities observed at MW-5-2 during 2005 were preceded by large fluctuations in water level and perched water quality during 2004. Whether these changes are related is presently unknown.

Technetium-99 was detected in 13 of the shallow perched wells during 2005 (Figure A-5). As with Sr-90, the highest levels of Tc-99 were observed in shallow perched monitoring wells located southeast of the tank farm, including wells MW-10-2 (349 pCi/L), 33-1 (178 pCi/L), MW-5-2 (43 pCi/L), ICPP-2018 (38 pCi/L), and MW-2 (35 pCi/L). None of the perched water samples exceeded the MCL for Tc-99, and none have approached the concentrations of 2,000 to 3,000 pCi/L Tc-99 that were observed at aquifer monitor well ICPP-MON-A-230 located north of the tank farm (Figure A-2). Tc-99 trends in several perched wells are shown in Figure A-11. The declining trends in these wells must be due to dilution/dispersion and transport to the deeper vadose zone, as the half-life of Tc-99 is long (213,000 years), and radioactive decay is insignificant over periods of a few years. Tc-99 concentrations observed in 2005 were similar to those observed in previous years. Perched water south and east of the tank farm has historically contained Tc-99 in the range of 400 to 700 pCi/L.

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a. Private communication, Terry Chesnovar, CH2M-CWI, Idaho Falls, ID, July 14, 2005.

I-129 was detected in 14 of the wells sampled during 2005 (Figure A-7 and Table B-3). The highest concentration (1.33 pCi/L) was detected in new shallow perched well ICPP-2018, located immediately south of the tank farm. This was the only well that exceeded the I-129 MCL (1 pCi/L). I-129 was detected in well 33-2 at 0.595 pCi/L, similar to that observed in 2004 (0.627 pCi/L). The low I-129 levels in the shallow perched wells are noteworthy, especially considering the high Sr-90 concentrations that persist in many of these wells. The low I-129 concentrations in the perched water (and in the SRPA) suggest that I-129 concentrations were relatively low in the principal radionuclide releases.

Tritium was detected in 14 of the 21 wells sampled during 2005. Tritium activities in all northern shallow perched water monitor wells were less than the MCL (20,000 pCi/L). Figure A-12 shows the trend in tritium concentration over time in several perched water monitor wells.

Cs-137 was detected in well 33-1 at 617 pCi/L. This is believed to be the first exceedance of the Cs-137 MCL (200 pCi/L) in perched water at INTEC. During 2004, Cs-137 was detected in well 33-1, but at a much lower concentration (20.4 pCi/L). However, the presence of Cs-137 in this well should not be too surprising considering the well contains among the highest Sr-90 levels of any of the monitoring wells, and elevated downhole gamma activity (presumably due to Cs-137) was detected to depths of 100 ft bgs during drilling of the well in 1991. Nevertheless, the appearance of Cs-137 exceeding the MCL was considered cause for concern. Therefore, additional steps were taken to determine if the Cs-137 was dissolved or adsorbed to the sediment, as described below.

When well 33-1 was sampled on May 11, 2005, a bailer was used to purge and sample the well. The field team noted a small amount of suspended sediment in the sample, and field radiological screening recorded 80,000 dpm of beta/gamma activity on the sediment at the bottom of the sample bottle (measured through the plastic bottle). At the contract lab, an aliquot of the perched water was filtered through a glass-fiber filter, and the filtered water was analyzed in duplicate for Cs-137. The glass-fiber filters were also analyzed in duplicate to determine the Cs-137 content of the filterable sediment. Subsequently, an aliquot of the perched water from well 33-1 was filtered through a 0.45-μm membrane filter, and the filtered water analyzed for Cs-137. Figure A-13 shows a histogram of the results for these tests. The results indicate that approximately 25% of the Cs-137 is adsorbed to suspended sediment that did not pass through the glass-fiber filter. Approximately 75% of the Cs-137 was able to pass through the 0.45-μm membrane filter and would therefore be categorized as "dissolved" Cs-137. A portion of this "dissolved" Cs-137 was likely bound to fine sediment particles (colloids) that were able to pass through the 0.45-μm membrane filter. The surging action of the bailer tends to agitate and mobilize sediment in the screened interval of the well. In August 2005, a dedicated Pro-Active sampling pump was installed in well 33-1 to reduce the amount of suspended sediment in the perched water samples from this well, resulting in more representative data. Monitoring well 33-1 was installed in 1991 to investigate radionuclide contamination associated with land disposal unit 33 (LDU-33) near the northeast corner of Building CPP-604 (Golder 1991). The source of the Cs-137 (and Sr-90) in this well is presumably attributable to the combined CPP-27/33 release sites located near the well (DOE-ID 2004b). Approximately 750 Ci of Cs-137 are estimated to have been released during the mid-1960s at Site CPP-27/33 (Swenson 2004).

Uranium-233/234 and uranium-238 isotopes were detected in all perched water samples during 2005 (Table B-3), as these isotopes are naturally occurring. With the exception of well 33-3 (18.5 μg/L), all of the northern shallow perched wells were within background limits for total uranium of 0 to 9 pCi/L, as determined by the United States Geological Survey for the SRPA (Orr et al. 1991). Uranium-235 was detected in several samples, but all the concentrations were close to the minimum detectable activity (MDA).

Np-237 and the plutonium isotopes were not detected in any of the perched water samples during 2005. Am-241 was reported in a single sample from well MW-1-4 at 0.0873 J pCi/L, only slightly above the MDA of 0.0526 pCi/L. The “J” flag indicates an estimated value that may not be accurate.

Nitrate/nitrite nitrogen results for several of the shallow perched wells exceeded the MCL of 10 mg/L during 2005 (Figure A-8), with the highest concentration of 24.9 mg/L (as N) observed at well 37-4 located near the former sewage treatment lagoons. The nitrate/nitrite results for the perched water samples were similar to those observed during 2004. Potential sources of nitrate include (a) past releases of nitric acid solutions at the tank farm and other locations and (b) nitrogen in treated wastewater effluent from the former sewage treatment lagoons.

As in past years, chloride was elevated above the secondary MCL of 250 mg/L in shallow perched well 33-3 during 2005 (948 mg/L) (Figure A-9). The elevated chloride in the perched water at this location has been attributed to an underground water softener brine pit (CPP-736) located about 100 ft north of this well (EDF-5758). The CPP-736 underground brine pit was installed in 1984 and replaced an older underground brine pit that was located along the north wall of the boiler house (CPP-606). CPP-736 is a 55,000-gal-capacity reinforced concrete underground tank. Brine impacts to the shallow perched water in this area were observed during 1994 at monitoring well 33-3, suggesting that leakage of sodium chloride brine from the brine pit or associating piping had occurred prior to that time. As of 2005, the CPP-736 underground brine pit is still in use, and brine impacts continue to be observed in well 33-3. On February 25, 2005, a brine leak was noted at the ground surface from the underground brine transfer line between CPP-736 and the boiler house (CPP-606). The leaking brine line was taken out of service at that time. As part of a water treatment system upgrade, a new replacement aboveground brine tank is planned to be installed during 2006 inside Building CPP-1647, and the old underground CPP-736 brine pit will be taken out of service and abandoned in place.

Both filtered and unfiltered samples were submitted for metals analysis. As compared to the filtered samples, the results for unfiltered samples indicated elevated concentrations of several metals (Al, Be, Cr, Cu, Fe, Hg, Mn, Ni, Pb, V, and Zn). Several of these metals, including lead and chromium, were elevated above MCLs in the unfiltered samples (Table B-4). In particular, northern shallow perched well 33-3 displayed the most elevated metals concentrations, probably as a result of corrosion of the stainless steel well casing or screen in the high-salinity water at this location. However, in the filtered samples, metals concentrations were low or nondetect, indicating that the elevated concentrations are attributable to acidification of the turbid (unfiltered) samples and are not representative of dissolved metals concentrations in the perched water. Mercury was not detected in any of the northern shallow perched water samples. Boron concentrations were slightly elevated in those wells most impacted by past releases of radionuclides, including wells ICPP-2018, MW-5-2, MW-2, 33-1, ICPP-2019, and 55-06. The presence of boron in these wells may reflect the past use of boron salts as a neutron poison to prevent criticality in uranium-containing solutions.

2.1.2 Central and Southern Perched Water Results

During the 2005 reporting period, the following shallow perched wells in the central and southern part of INTEC were sampled: MW-7-2, MW-9-2, MW-15, MW-17-2, and CS-CH. The shallow perched wells around the former percolation ponds (PW-series wells) were either dry or contained insufficient water to permit sampling. Perched water monitor wells at the Idaho CERCLA Disposal Facility are sampled quarterly and are reported in INEEL (2004).

Tritium was detected in MW-7-2 (132-142 ft bgs) at 30,800 pCi/L and in MW-17-2 (182 to 192 ft bgs) at 21,000 pCi/L (Figure A-6). Both of these wells, located east of CPP-603 in the southern part of INTEC, displayed the highest tritium activities observed in perched water during 2005, and both exceeded the tritium MCL of 20,000 pCi/L. The trend in tritium at MW-17-2 is shown on Figure A-12 and appears to show declining tritium concentrations from 2001 to 2005.

Historically, Sr-90 and Tc-99 have also been detected in other CPP-603 area wells when sufficient water was available for sampling (DOE-ID 1998). During this reporting period, elevated concentrations of Sr-90 were observed in MW-15 (5,330 pCi/L) and MW-9-2 (2,400 pCi/L). In contrast, Sr-90 levels were very low or nondetect in the two wells with the highest tritium activities (MW-7-2 and MW-17-2). Tc-99 was detected at low levels in nearly all of the central and southern shallow perched wells, at concentrations as high as 18 pCi/L (MW-15). The presence of Sr-90, Tc-99, tritium, and other fission products in the perched water near CPP-603 is attributed primarily to past releases associated with the CPP-603 facility (Robertson et al. 1974), including CERCLA sites CPP-01 and CPP-02 (DOE-ID 1997a).

Am, Np, and Pu were not detected in any of the central and southern perched wells during 2005. The only gamma-emitting radionuclide detected in this area was a low level of Co-60 (10.4 pCi/L) reported in MW-15. This concentration was less than the MDA (16.2 pCi/L) and far below the MCL of 100 pCi/L. This is the first known detection of Co-60 in MW-15. Co-60 has a half-life of 5 years and is an activation product associated with spent nuclear fuel.

Elevated gross alpha activities that exceeded the MCL (15 pCi/L) were reported for several of the central and southern perched wells. These include CS-CH (37.2 pCi/L), MW-17-2 (31.8 pCi/L), and MW-9-2 (20.5 pCi/L). At well CS-CH, the gross alpha activity appears to be primarily due to the combined presence of U-233/234 (9.88 pCi/L) and U-238 (8.46 pCi/L) in this well. The field notes indicated that the bailed water sample from CS-CH was extremely turbid, and the elevated gross alpha and uranium levels appear to be associated with the suspended sediment. The reason for the elevated activity in the other two wells is unclear, as the concentrations of each of the individual alpha-emitting radionuclides were either nondetect (Am, Np, Pu isotopes) or at background levels (U isotopes).

Similar to the northern shallow perched wells, metals concentrations in perched water beneath the central and southern INTEC were elevated in the unfiltered samples, but concentrations were significantly lower in the filtered samples, indicating that the metals in the unfiltered samples are associated with suspended solids (Table B-4).

Unlike the northern shallow perched water, nitrate concentrations were not particularly elevated in the central or southern perched wells (Table B-4). The only southern perched well that exceeded the nitrate-nitrogen MCL (10 mg/L) was MW-9-2 (11 mg/L). The low chloride concentrations in MW-7-2, MW-9-2, MW-15, and MW-17-2 suggest that the former percolation ponds are not the principal source of the water remaining in these wells, because the service wastewater that was sent to the former percolation ponds had relatively high chloride concentrations (>200 mg/L). The combined recharge sources from precipitation infiltration and fire water and line leaks are believed to account for the continued presence of perched water near CPP-603.

2.1.3 Deep Perched Water Results

During the 2005 reporting period, the following deep perched wells were sampled: BLR-DP, MW-1-4, and USGS-50. Other deep perched wells were dry or did not contain enough water to sample (Table B-1). Well MW-1-4 is screened at a somewhat shallower depth (326-336 ft bgs) than other deep perched wells but is grouped with these for this discussion. The deep perched water zone lies at depths of approximately 380 to 400 ft. Contamination in the deep perched zone has a different composition than the shallow perched water. Elevated concentrations of tritium, Sr-90, and I-129 (and possibly Tc-99) in the deep perched zone are at least partially attributable to the former INTEC injection well (Site CPP-23), which routinely received in excess of 1 mgd of low-level radioactive service waste from 1952-1984.

The primary radionuclide contaminants in the deep perched water are Sr-90 and tritium. The deep perched water from USGS-50 contained Sr-90 at 120 pCi/L, which exceeds the MCL (8 pCi/L). This value is similar to that reported in 2004 (118 pCi/L), but Sr-90 levels in this well have declined significantly from those observed during the early 1980s when the injection well was still in operation.

Technetium-99 was detected in deep perched well USGS-50 at 31.1 pCi/L. None of the samples from this or other deep perched wells has ever exceeded the MCL for Tc-99 of 900 pCi/L, and none have approached the concentrations of 2,000 to 3,000 pCi/L Tc-99 observed at aquifer monitor well ICPP-MON-A-230 located north of the tank farm (Figure A-2). Tc-99 trends in USGS-50 are shown in Figure A-11. Tc-99 concentrations have declined since 1994 when repairs were made at USGS-50 to reduce downward cascading of water in the well.

The only deep perched well in which I-129 was detected was USGS-50 (0.839 pCi/L). This value is slightly higher than observed during the past few years in this well (0.62 in 2001; 0.569 in 2004). The low I-129 concentrations observed in the deep perched water at USGS-50 over the past few years suggest that the amount of residual I-129 remaining in the deep vadose zone from the former INTEC injection well is not sufficient to cause an exceedance of the MCL.

As in the past, the deep perched water at USGS-50 located southwest of the tank farm contained elevated tritium activity (19,800 pCi/L in 2005). Tritium activities in the other deep perched wells were less than the MCL of 20,000 pCi/L. Figure A-12 shows the trend in tritium concentration over time in USGS-50. The trend plot shows a clear and steady decline in tritium over the past 20 years since the former INTEC injection well was taken out of service. The rate of decline exceeds that predicted by radioactive decay alone. The difference is most likely attributable to a combination of hydrodynamic dispersion and downward transport of deep perched water toward the aquifer.

Mercury was detected in the unfiltered sample from deep perched well USGS-50 at 1.5 μg/L, which is similar to the level observed during 2004 (1.3 μg/L). However, mercury was not detected in the filtered sample submitted for dissolved mercury analysis, indicating that most of the mercury is bound to the suspended sediment. None of the samples exceeded the mercury MCL of 2 μg/L.

Uranium-233/234 and uranium-238 isotopes were detected in the deep perched water, but concentrations were within background limits for total uranium determined by the United States Geological Survey for the SRPA of 0 to 9 pCi/L, suggesting that the concentrations are background (Table B-3).

As noted above for the shallow perched wells, metals concentrations were elevated in the unfiltered deep perched water samples, but concentrations were significantly lower in the filtered samples, indicating that the metals in the unfiltered samples are primarily associated with suspended solids (Table B-4).

Nitrate concentrations were elevated above the MCL of 10 mg/L-N in two of the deep perched water wells: MW-1-4 at 41.4 mg/L and USGS-50 at 28.6 mg/L. The concentration of nitrate in MW-1-4 continues to show a trend of slightly decreasing concentrations over time (see Figure B-7 in DOE-ID 2003b).

Deep perched water pH values were between 7 and 8, and EC values ranged from 0.722 to 0.920 mS/cm (Table B-2). The elevated EC values in these wells correspond with elevated chloride, sulfate, and total dissolved solids concentrations (Table B-4).

2.1.4 Lysimeter Results

Suction lysimeters permit sampling of water from unsaturated materials. Lysimeter data are discussed separately, in part because the results may not be directly comparable to samples from perched monitoring wells. Lysimeters sampled during 2005 are listed in Table B-1. Lysimeters from which vadose zone water samples were collected include five lysimeters inside the tank farm (A-60 series) and 17 lysimeters located elsewhere around INTEC (BLR [Big Lost River], CS [central set], PP [percolation pond], STL [sewage treatment lagoon], and TF [tank farm] well set lysimeters). In most cases, only partial water samples were obtained from the lysimeters, and the list of laboratory analytes for each lysimeter is shown in Table B-1. The lysimeter locations are shown on Figure A-3. The lysimeter water quality results are included in Tables B-3 and B-4. Due to limited sample volumes, vadose zone water samples collected from suction lysimeters were analyzed for only a limited suite of constituents, including Sr-90, Tc-99, tritium, metals, and anions. Even then, each lysimeter only yielded sufficient water for analysis of a subset of these constituents (Table B-1).

Samples collected from the suction lysimeters at INTEC generally contained lower radionuclide concentrations than the perched water samples collected from nearby monitoring wells (Table B-3). The water samples from CS-SP-L122 and CS-SP-L155 contained Sr-90 at 17 and 14.7 pCi/L, respectively, and were the only lysimeter samples that exceeded the Sr-90 MCL of 8 pCi/L. A similar Sr-90 activity was detected in lysimeter CS-SP-L155 when it was sampled during 2004. Sr-90 concentrations were <3 pCi/L in the other lysimeters sampled during 2005 (Table B-3).

Concentrations of Tc-99 and tritium did not exceed MCLs in any of the lysimeters. The highest Tc-99 activity (22.2 pCi/L) was observed at lysimeter CS-DP-L280, and the highest tritium activity (1,800 pCi/L) was observed at the same lysimeter. The presence of tritium and Tc-99 at this location is consistent and may reflect past discharge of service waste to the deep vadose zone at the former INTEC injection well.

Chloride concentrations were low (<100 mg/L) in the BLR, STL, and CS lysimeters, whereas higher chloride concentrations (>100 mg/L) were observed at several lysimeters located near the former percolation ponds (PP set) and tank farm (TF set). The elevated chloride concentrations observed at the PP-SP and PP-DP lysimeters are consistent with the elevated salinity of the service waste discharged to the former percolation ponds. Fluoride concentrations were below the MCL (4 mg/L) in all of the lysimeter samples.

Elevated sulfate concentrations were observed at lysimeters TF-SP-L118 (2,330 mg/L), PP-SP-L169 (1,510 mg/L), and PP-AL-L27 (1,220 mg/L). The source(s) of elevated sulfate at these locations is unknown but may be partially derived from the service waste previously discharged to the former injection well and former percolation ponds. The elevated sulfate at TF-SP-L118 is accompanied by a very high sodium concentration (1,380 mg/L), which indicates that a high-salinity, sodium-sulfate-type water is present in the vadose zone in this area.

Manganese concentrations exceeding the secondary (aesthetic) MCL of 50 μg/L were reported at tank farm lysimeter A-65-36 (a concentration of 339 μg/L). The elevated manganese concentration is likely indicative of anoxic (anaerobic) conditions at this location, which can result in dissolution of manganese oxide minerals. Elevated manganese concentrations were also observed at several of the perched water monitoring wells (Table B-4).

Total uranium concentrations exceeding the MCL of 30 μg/L were observed at two lysimeters (Table B-3), with the highest concentration observed at TF-SP-L118 (187 μg/L), located north of the INTEC tank farm. As was observed during 2004, this same lysimeter also contains elevated concentrations of sodium and sulfate. Water sample volumes from the suction lysimeters were insufficient to permit analysis of uranium isotopic ratios.

2.2 Perched Water Levels and Hydraulic Gradients

This section provides a brief overview of perched water level patterns and trends. Additional detailed information regarding the factors that influence shallow perched water levels and water volumes is presented in Appendix C of this report.

Table B-5 summarizes the manual water level measurements for the period 2004-2005. Both manual and automated measurements are included on the hydrographs in Appendix D. Downhole water temperature and EC data obtained from the Leveloggers are included in Appendix E.

Figure A-14 shows the lateral extent of the northern shallow perched water during 2005. Shallow perched water was present under most of the northern half of INTEC. Areas where shallow perched water was not observed during the reporting period were (1) the central portion of the facility roughly between the dry fuel storage area and Binsets 1-3, (2) the extreme eastern area east of Binsets 4-7, and (3) the extreme northeast part of INTEC.

Manual water level measurements were performed monthly during 2004-2005 using a Solinst electronic water level sounder (e-line). Automatic water level measurements were recorded every half hour in selected perched water wells using In-Situ miniTroll and Solinst Levelogger downhole pressure transducers. The following discussion focuses on the period September 2004 through September 2005.

2.2.1 Perched Water Level Changes

Since the previous annual report (DOE-NE-ID 2004), some of the more notable changes in perched water levels are as follows:

- Well 33-1: This well is screened 89-99 ft bgs and is located at the south edge of the tank farm. The well had been dry for several years prior to April 14, 2004, when approximately 1 ft of water was observed in the well (Appendix D). Water persisted in the well for most of 2004 and rose to its highest level during April-June 2005 (about 2 ft of water in well). The perched water at 33-1 contains high levels of Sr-90 (188,000 pCi/L) and also exceeded the Cs-137 MCL during 2005. The reason for the appearance of water in the well is unknown.

- Well 33-3: This well is screened 112-122 ft bgs and is located near the northwest corner of the tank farm. Beginning on April 14, 2005, the water level abruptly rose approximately 3.5 ft over 1 week, then slowly declined over the succeeding several months (Appendix D). The abrupt change in water level in this well is believed to be the result of a leak of potable water from an underground pipeline located approximately 300 ft to the west of the well near CPP-1673. The 1-M-gal leak occurred during the period March 30 to April 9, 2005.

- Well MW-5-2: This well is screened 106-126 ft bgs and is located at the south edge of the Waste Calcining Facility cap. The water level in this well gradually rose approximately 10 ft during 2003, peaking in March 2004. The level then declined approximately 12 ft during the remainder of 2004 and the first half of 2005 (Appendix D). The reason(s) for the significant rise and fall of the water level during the ongoing drought is not clear but may be related to an underground steam line leak located about 300 ft south of the well near CPP-1608. The steam line was reportedly isolated (shut off) in late 2004.

- MW-6: This well is screened 117-137 ft bgs and is located near the southeast corner of the INTEC cafeteria. Beginning on April 1, 2005, the water level abruptly rose approximately 8 ft over 2 weeks, then slowly declined over the succeeding several months (Appendix D). The abrupt change in water level in this well is believed to be the result of a leak of potable water from an underground pipeline located approximately 200 ft to the north of the well near CPP-1673. The 1-M-gal leak occurred during the period March 30 to April 9, 2005, when the leak was located and isolated (shut off).

- Well MW-15: This well is screened 111-131 ft bgs and is located in the south part of INTEC near the southeast corner of CPP-603. It had been dry for nearly 2 years, but on August 23, 2004, approximately 21 ft of perched water was observed in the well. Subsequent monitoring (Appendix D) showed relatively constant water levels through January 11, 2005, when the well became inaccessible due to excavation of the nearby SFE-20 underground tank. The well was dry when next measured on August 1, 2005. The reason for the sudden appearance and disappearance of water in the well is unknown but may be related to an underground fire water line leak located near the southeast corner of CPP-603. This leak was repaired on August 22, 2005.

- MW-24: This well is screened 53-73 ft bgs and is located near the Sewage Treatment Plant at the northeast corner of INTEC. The water level in the well dropped sharply during December 2004 to January 2005 (Appendix D) after the former sewage infiltration trenches were taken out of service on December 4, 2004. By April 13, 2005, MW-24 had become dry.

- Well BLR-CH: This shallow perched well is located about 500 ft southeast from the BLR, is screened 120-130 ft bgs, and is the closest monitoring well to the river channel. Beginning on June 4, 2005, the water level abruptly rose approximately 8 ft over 1 week, then slowly declined over the succeeding several months (Appendix D). The abrupt change in water level in this well is believed to be the result of a brief period of flow in the BLR that occurred May 29, 2005, to June 8, 2005.

- Well PW-4: This well is screened 110-150 ft bgs and is located at the east edge of the former percolation ponds. Since relocation of the percolation ponds in August 2003, the water level gradually declined more than 50 ft. Sometime between May 19, 2005, and June 27, 2005, the water level rose approximately 30 ft, then rapidly declined a similar amount over the succeeding 2 months (Appendix D). The abrupt changes in water level in this well are believed to be the result of heavy rains during the period May 5-19, 2005, and infiltration of storm water into the bottom of the former percolation ponds. As discussed in the 2004 annual report (DOE-NE-ID 2004), PW-4 is believed to be screened at a low point at the top of the 140-ft sedimentary interbed where perched water accumulates. The same storm event that caused a rise in water level at PW-4 is likely responsible for a few feet of perched water that temporarily appeared in nearby shallow alluvium well PP-AL (screened 30-31 ft bgs) during May-June 2005.

- Well 37-4: The water level in well 37-4 rose several feet during May-June 2005 (Appendix D), probably in response to 3.5 in. of precipitation that occurred during May 5-19, 2005. During that storm event, ponded rainwater was observed in a broad area around Well 37-4.

- Well MW-18-1: Deep perched well MW-18-1 is located at the south side of Binsets 1-3 and is screened at 393-414 ft bgs. This well contained several feet of perched water during 2004 but was dry from January 17, 2005, to the end July 2005. The two nearby deep perched wells, ICPP-2020 and ICPP-2021, have also been dry or nearly dry since their installation in April 2005.

Figure A-15 shows hydrographs for selected shallow perched wells in the northern portion of INTEC, and the hydrographs for individual wells are included in Appendix D. Water levels in shallow perched wells 55-06 and MW-2 remained relatively constant over the past year. As in the past, these two wells show very similar water level responses, and their hydrographs are essentially superimposed. As has been noted previously, the similar water level patterns for both wells suggest that the wells have the same source of water and that they are likely hydraulically connected. Likewise, wells 33-2 and 33-4-1 show similar water level responses over time.

In the lower shallow perched water near the tank farm, water levels in MW-10-2 were relatively steady during 2005, whereas MW-20-2 showed a 2-ft water level rise during April-May 2005, probably in response to the mid-May storm event. Roof runoff from CPP-699 discharges to the ground very close to MW-20-2, which is likely a contributing factor in the observed response of this well to precipitation and snowmelt.

In the deep perched zone, well BLR-DP exhibited a steady decline in water level of nearly 10 ft beginning in early 2001 and continuing until October 2003, followed by 5-ft rise until October 2004, and declining water levels during late 2004 and early 2005 (Appendix D). In contrast to shallow perched well BLR-CH, no obvious water level change occurred in BLR-DP during the months immediately following the BLR flow event of early June 2005. Rather, water levels in BLR-DP appear to respond slowly to annual changes in precipitation. In contrast, water levels in deep perched well MW-1-4 showed a 4-ft rise in water level during April-May 2004, with a similar decline during the fall. This rise appeared to repeat during spring 2005 and is likely attributable to infiltration of snowmelt in the western portion of INTEC.

The above observations clearly demonstrate that shallow perched water levels can respond very rapidly (days) to surface recharge events, such as heavy rain, a large water leak, or, for wells near the northwest corner of INTEC, flow in the BLR. Moreover, a detailed analysis of shallow perched water level fluctuations (Appendix C) indicates that the combined recharge from precipitation infiltration and leaks from INTEC pipelines is of greater importance than BLR streamflow infiltration with respect to contaminant transport in the shallow perched water beneath the tank farm area.

2.2.2 Perched Water Hydraulic Gradient and Flow Direction

The lateral extent of shallow perched water beneath the northern portion of INTEC is shown on Figure A-14. The extent of shallow perched water has not changed since 2004. As indicated on the map, the following shallow perched wells were dry during the monitoring period: MW-4-2, MW-8, MW-12-2, and MW-18-2. The upper shallow perched zone generally coincides with the 110-ft sedimentary interbed and is defined as perched because it is underlain by unsaturated materials of the deeper vadose zone. Perched water tends to flow vertically downward but may also flow laterally where a horizontal hydraulic gradient exists and where low-permeability units are present that impede downward flow. Compared with groundwater flow in the underlying SRPA, flow paths in the perched water can be tortuous and difficult to predict.

The water level data for May 16, 2005, (Table B-5) were used to calculate inferred shallow perched water flow directions and hydraulic gradients. These calculations are based on the assumptions that the wells selected are hydraulically connected and are completed in the same continuous perched water zone. Because of uncertainties regarding these assumptions, the perched water flow calculations below should be used with caution.

Based on similarities in well depth and water level response, the following shallow perched wells were selected for analysis of perched water gradients and flow directions: 33-2, 33-4-1, 37-4, 55-06, MW-2, ICPP-2018, and ICPP-2019. Monitoring well 33-1 was not used because it is screened at a shallower depth (above the upper shallow perched). Wells MW-4-2, MW-8, MW-12-2, and MW-18-2 were not included in the analysis because they were dry on the monitoring date. Wells 33-3, MW-6, MW-10-2, and MW-20-2 were not used for the contour map because all of these are screened deeper (in the lower shallow perched water). And, lastly, MW-5-2 was not used for the contour map because, although it appears to be screened in the upper shallow perched zone, it is screened slightly deeper than the others (across the 110-ft interbed), and the water level in this well during 2005 was significantly lower than the other wells.

Figure A-16 is a water level contour map for selected upper shallow perched wells on May 16, 2005. Water level elevations are in units of feet above mean sea level (National Geodetic Vertical Datum of 1929). The water elevation data suggest that lateral flow in the shallow perched water beneath the northern INTEC area is generally to the southeast, which is consistent with similar data from 2004 (DOE-NE-ID 2004). The inferred flow direction from the hydraulic gradient generally coincides with the southeasterly dip of the top of the 110-ft interbed beneath and south of the tank farm (Figure A-17). The water level contour map also shows a flattening of the hydraulic gradient in the vicinity of MW-2 southeast of the tank farm. Again, note that downward vertical flow is also expected for the shallow perched water, but such vertical flow cannot be shown on the plan view water level maps.

The perched water level contour map shows a southeasterly hydraulic gradient of approximately 0.02 ft/ft to the southeast. A constant-rate pumping test performed on MW-5-2 during 1995 indicated a horizontal hydraulic conductivity (K_H) of approximately 1.3×10^{-3} cm/s (DOE-ID 1997a). Current estimates of the effective porosity of the fractured basalt range from 0.03 to 0.05. Assuming the latter value and substituting the previous values into Darcy's Equation give the following estimate of perched water horizontal seepage velocity:

$$V_H = (K_H * I) / n = (1.3 \times 10^{-3} \text{ cm/s} * 0.02) / 0.05 = 5.2 \times 10^{-4} \text{ cm/s} = 0.5 \text{ m/day} \quad (1)$$

where

V_H = horizontal seepage velocity (cm/s)

K_H = horizontal hydraulic conductivity (cm/s)

I = horizontal hydraulic gradient (dimensionless)

n = effective porosity (dimensionless).

This calculation suggests perched water horizontal flow velocities of up to 0.5 m/day toward the southeast. Note that this calculation assumes an isotropic, porous medium, and this assumption is not valid for the fractured basalt. Actual flow velocities through joints in the basalt could be considerably faster than the calculated 0.5 m/day.

2.3 Perched Water Temperatures

Appendix E contains graphs of downhole water temperatures and EC values determined using Solinst Levelogger instruments. During 2005, wells MW-2, ICPP-2018, MW-5-2, and 33-3 had the highest perched water temperatures of approximately 21, 20.5, 20, and 19.5°C, respectively, while the other perched wells had temperatures of 9 to 17°C. These same wells showed the highest temperatures during 2004 (except for new well ICPP-2018). MW-24 had the coldest temperatures of 9 to 10°C, which likely reflect the infiltration of cold wastewater effluent from the Sewage Treatment Plant at the former infiltration trenches.

Most of the perched wells displayed relatively constant temperatures over time, as measured with Solinst Leveloggers. Wells that showed unusual temperature fluctuations during the reporting period included

- Well MW-5-2: A rapid water temperature increase of 1°C was observed during September 2004 at this well (Appendix E). The temperature rise generally correlates with an unusual pulse of high-salinity water, as discussed below. The reason for the temperature rise is unknown but may possibly be related to an underground steam line leak located about 300 ft south of the well near CPP-1608.

- MW-24: Oscillations in water temperature during 2004 and 2005 appear related to rapid water level changes in response to variable discharge of treated wastewater effluent to the former sewage infiltration trenches near this well.

The wide range of perched water temperatures is noteworthy. In general, the highest temperatures occur in the vicinity of Binsets 1-3. This is to be expected as the calcine solids in the binsets give off considerable decay heat. Rapid temperature changes at a particular well most likely indicate a nearby recharge source.

2.4 Perched Water Electrical Conductivity

Appendix E contains graphs of downhole EC values determined using Solinst Levelogger instruments. Electrical conductivity is an indicator of water salinity, with higher EC indicating higher salinity. Most of the perched wells displayed relatively constant downhole EC values over time, as measured with Solinst Leveloggers. Wells that showed unusual EC fluctuations during the reporting period included

- Well 33-2: Several unusual "pulses" of high-salinity water (higher EC) were observed at this well during the reporting period (Appendix E). During the most pronounced salinity pulse, the EC of the perched water at 33-2 rose rapidly during early March 2005 to more than triple its initial value, then declined just as sharply to background values in mid-April. The cause of the EC pulses at 33-2 is unknown but may be attributable to a brine leak that occurred on or about February 25, 2005, at CPP-1610 about 500 ft north of the well. On that date, a sodium chloride brine leak of unknown volume occurred from an underground line between the exterior brine tank and the water softeners in CPP-606.

- Well 33-3: This well has historically displayed the highest EC values, presumably as a result of saline impacts from the nearby brine pit and associated piping (EDF-5758). At well 33-3, a large EC pulse was observed during mid-April 2005 (Appendix E). On April 14, 2005, the EC of the perched water at 33-3 rose rapidly to nearly 10 times its initial value, reaching a very high peak EC of 18.8 mS/cm on April 16, 2005. This value approaches that of seawater. The beginning of the EC pulse coincides with an abrupt rise in water level in the well, which, in turn, is believed to have resulted from a 1-M-gal potable water line leak in early April at CPP-1673. The EC of the perched water at well 33-3 then declined slowly over several months but remained well above background levels. The cause of the large EC pulse at well 33-3 is not known, but concentrated sodium chloride brine, perhaps from the brine leak that occurred nearby at CPP-1610 on February 25, 2005, probably was displaced downward into the well screen by the potable water leak.

- Well MW-5-2: An unusual "pulse" of high-salinity water (higher EC) was observed at this well during August-September 2004 (Appendix E). During this period, the EC of the perched water at MW-5-2 rose rapidly from less than 0.5 mS/cm to over 4.0 mS/cm and then declined very sharply to below 1.0 mS/cm. The reason for the EC pulse is unknown but may possibly be related to an underground steam line leak located about 300 ft south of the well near CPP-1608.

- MW-10-2: An unusual "pulse" of high-salinity water (higher EC) was observed at this well during October-November 2004. The EC pulse is similar to, but smaller in magnitude than, the one that occurred about 6 weeks earlier in MW-5-2 (Appendix E). The reason for the EC pulse is unknown but may possibly be related to an underground steam line leak located south of the well near CPP-1608.

- MW-24: Oscillations in EC during late 2004 and 2005 appear to correspond with rapid water level changes, culminating with the well going dry by April 13, 2005, in response to decommissioning of the former sewage infiltration trenches located near this well.

As with temperature fluctuations, large changes in downhole EC are believed attributable to specific recharge events that impact nearby wells. As such, the EC data are useful in identifying areas where recharge is actively occurring.

2.5 Tensiometer Moisture Monitoring Data

According to the MSIP (DOE-ID 2005), collection of soil moisture data is required to determine whether moisture contents in the vadose zone decreased after relocation of the percolation ponds. As part of the Phase I monitoring discussed in the MSIP, tensiometers were installed in the alluvium, shallow perched water zone, and deep perched zone at each of the five new well sets (BLR, STL, TF, CS, and PP) to determine spatially distributed matric potential for comparison with future data sets. In addition to providing matric potential data for calculating soil moisture contents in the vadose zone, tensiometric data may be used to further clarify sources of groundwater recharge at INTEC and may help to identify dominant flow gradients (that is, vertical or lateral flow) at each of the well sets. Pressure transducers and data loggers were used to measure and record soil-water tension or pressure at each of the installed tensiometers. The tensiometer plots (Appendix E) show soil-water potentials recorded from July 2001 to August 2005.

2.5.1 Big Lost River Set

Tensiometer BLR-SP1 at 132 ft shows wide oscillations in soil-water potential during the period 2001 to present (Appendix F). These changes correlate well with water level changes in nearby perched well BLR-CH and most likely represent wetting-drying cycles in response to seasonal infiltration of surface water. The tensiometer was completed in basalt overlying silty clay (the assumed perching material) and appears to wet and dry very rapidly. As noted in the MWTS Report (DOE-ID 2003a), the rapid wetting and large pressure range may result because the tensiometer was installed in basalt with a very low effective porosity. The 2003-2005 monitoring period is the wettest period observed at this location since installation of the instruments in 2001, and soil-water potentials during 2004 exceeded +200 cm at several depths, indicating saturated conditions. Soil moisture at depths of 132, 167, and 352 ft reached maximum values in September 2004 and began to decline throughout the remainder of the 2004 and 2005. The tensiometer at the 352-ft depth displayed some particularly rapid fluctuations in water potential. Because the BLR has not flowed from May 2000 until May 2005, river recharge cannot be responsible for the progressive wetting of the BLR tensiometers over the past 2 years. One possible explanation for the wet conditions, and observed changes in vadose zone moisture contents, is infiltration of water into the unlined ditch adjacent to the BLR well set (Figure A-2). Sources of water to the ditch include snowmelt, storm runoff, and discharge of cooling water from the diesel fire water pumps located adjacent to the two INTEC deep supply wells (CPP-01 and CPP-02). Another possible explanation for the wet conditions during early 2004 is leakage of fire water from the underground pipeline leading from well CPP-02 (Figure A-2). This leak was repaired in October 2004, and water potentials at the BLR tensiometers began to decline after that date. As noted in the previous annual report, the data from the BLR-AL tensiometer at 33 ft are believed to be suspect, based on neutron log indications of relatively dry material at the tensiometer installation depth.

2.5.2 Central Set

Tensiometer CS-SP2 at 155 ft shows significant fluctuations in soil-water potential during the period 2001 to present (Appendix F). These changes most likely represent wetting-drying cycles in response to variable surface water infiltration rates. The year 2005 is the wettest period since well installation in 2001 and indicates saturated conditions at this depth. Shallow tensiometer CS-SP1 at 122 ft exhibits several sharp upward spikes during 2001 to 2004 that appear to represent rapid wetting events or infiltration pulses at this depth. Except for CS-AL installed in the surficial alluvium, all of the CS tensiometers currently show positive pressure heads, indicating saturated conditions.

2.5.3 Percolation Pond Set

The tensiometers of the percolation pond set show the drain out of perched water following the cessation of service wastewater flow at the former percolation ponds in August 2002 (Appendix F). The PP-SP3 tensiometer at 169 ft showed a rapid decline in soil-water pressures soon after the former percolation ponds were taken offline and flow was diverted to the new percolation ponds. PP-SP3 became unsaturated in March 2003, with pressure leveling off in May 2003. Since that time, water potentials at this depth have remained nearly constant at –40 cm, indicating unsaturated conditions. Soil-water potentials at all depths have remained relatively constant over the past year, with the possible exception of the 109-ft depth, which shows a slight wetting trend.

2.5.4 Sewage Treatment Lagoon Set

With the exception of STL-SP1, soil-water pressure readings at the sewage treatment lagoons are relatively steady over the entire monitoring period (Appendix F). At STL-SP1, installed at the 104-ft depth, several subdued annual wetting-drying cycles are apparent between 2001 and 2004, with negative soil-water potentials of about –100 cm throughout this period. During the past year, this tensiometer indicates progressively wetter conditions approaching saturation. Because the BLR has not flowed from May 2000 until May 2005, river recharge cannot be responsible for the progressive wetting of the tensiometer at this location. The most likely explanation for the increasingly wet conditions is infiltration of water into the unlined ditch adjacent to the STL well set (Figure A-2). Sources of water to the ditch include snowmelt, storm runoff, and discharge of cooling water from the diesel fire water pumps located adjacent to the two INTEC deep supply wells (CPP-01 and CPP-02).

2.5.5 Tank Farm Set

At the tank farm well set, saturated conditions (positive soil-water pressures) have consistently been observed at tensiometers TF-AL (35-ft depth) and TF-SP2 (157-ft depth). The presence of saturated conditions at the 157-ft depth is supported by the presence of perched water in nearby monitoring well TF-CH, which is screened at 145-150 ft bgs. Tensiometer TF-SP1 (118-ft depth) displays relatively wet unsaturated conditions and an overall wetting trend between 2001 and 2005. This tensiometer also displays several sharp negative spikes in soil-water potential that correspond with the dates when vacuum was applied during sampling of the adjacent suction lysimeter. The presence of these "vacuum spikes" confirm that the tensiometer is responding to changes in soil-water tension. Tensiometer TF-DP (388-ft depth) shows soil-water potentials close to zero, indicating moisture contents are near saturation.

3. SUMMARY

Water levels were measured in perched monitoring wells to evaluate the lateral extent of perched water and the location of potential recharge sources at INTEC. Perched water beneath the northern part of INTEC has persisted during 2002-2005, in spite of the drought during that time. A combination of precipitation (rainfall and snowmelt) and discharges and leaks of water from facility pipelines appears to account for continued recharge of the perched water beneath the northern part of INTEC. A detailed analysis of shallow perched water level fluctuations indicates that the combined recharge from precipitation infiltration and leaks from INTEC pipelines is more important than BLR streamflow infiltration with respect to contaminant transport in the shallow perched water beneath the tank farm area.

Laboratory results in this report are compared to drinking water MCLs. Such comparison is for reference only and does not imply that the perched water zones constitute aquifers capable of sustained long-term yield. Moreover, the OU 3-13 ROD does not require that perched water comply with drinking water standards.

During 2005, Sr-90 was the principal radionuclide detected in perched water at concentrations exceeding the MCL. Sr-90 concentrations exceeded the MCL of 8 pCi/L in 16 of the 23 perched wells sampled, with shallow perched well MW-2 displaying the highest Sr-90 activity (188,000 pCi/L). Cs-137 was detected in a single well (33-1) at a concentration of 617 pCi/L, which exceeds the MCL of 200 pCi/L.

Tritium concentrations exceeded the MCL of 20,000 pCi/L in two of the wells. The highest tritium concentration observed during 2005 was 30,800 pCi/L in MW-7-2, located in the southern part of INTEC.

Iodine-129 was detected at low concentrations in many of the perched wells but exceeded the MCL of 1 pCi/L at only one well near the tank farm (ICPP-2018; 1.33 pCi/L). Technetium-99 was detected in several perched wells, but the maximum concentration observed (349 pCi/L) was below the MCL of 900 pCi/L. Other radionuclides detected in one or more perched water samples at concentrations below MCLs include U-233/234, U-235, and U-238. Concentrations of uranium isotopes were similar to background levels at all locations, and none of the total uranium concentrations exceeded the MCL of 30 µg/L. At nearly all locations, radionuclide concentration trends were either relatively constant or slowly declining over time.

Nitrate is the predominant inorganic contaminant in the perched water. Nitrate concentrations exceeding the MCL (10 mg/L NO_3-N) were observed in several shallow and deep perched wells in the northern part of INTEC, with the highest concentration observed at well MW-1-4 (41.4 mg/L NO_3-N). Nitrate concentrations were generally consistent with historical levels.

Several metals were detected at concentrations above their respective MCLs in unfiltered perched water samples, including chromium and lead. Metals concentrations were much lower in the filtered samples from the same wells, however, indicating that elevated metals concentrations are attributable to suspended particulates in the turbid, unfiltered samples, and a portion of the sediment dissolved when the samples were acidified to preserve them.

4. REFERENCES

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Appendix A

Figures

FIGURES

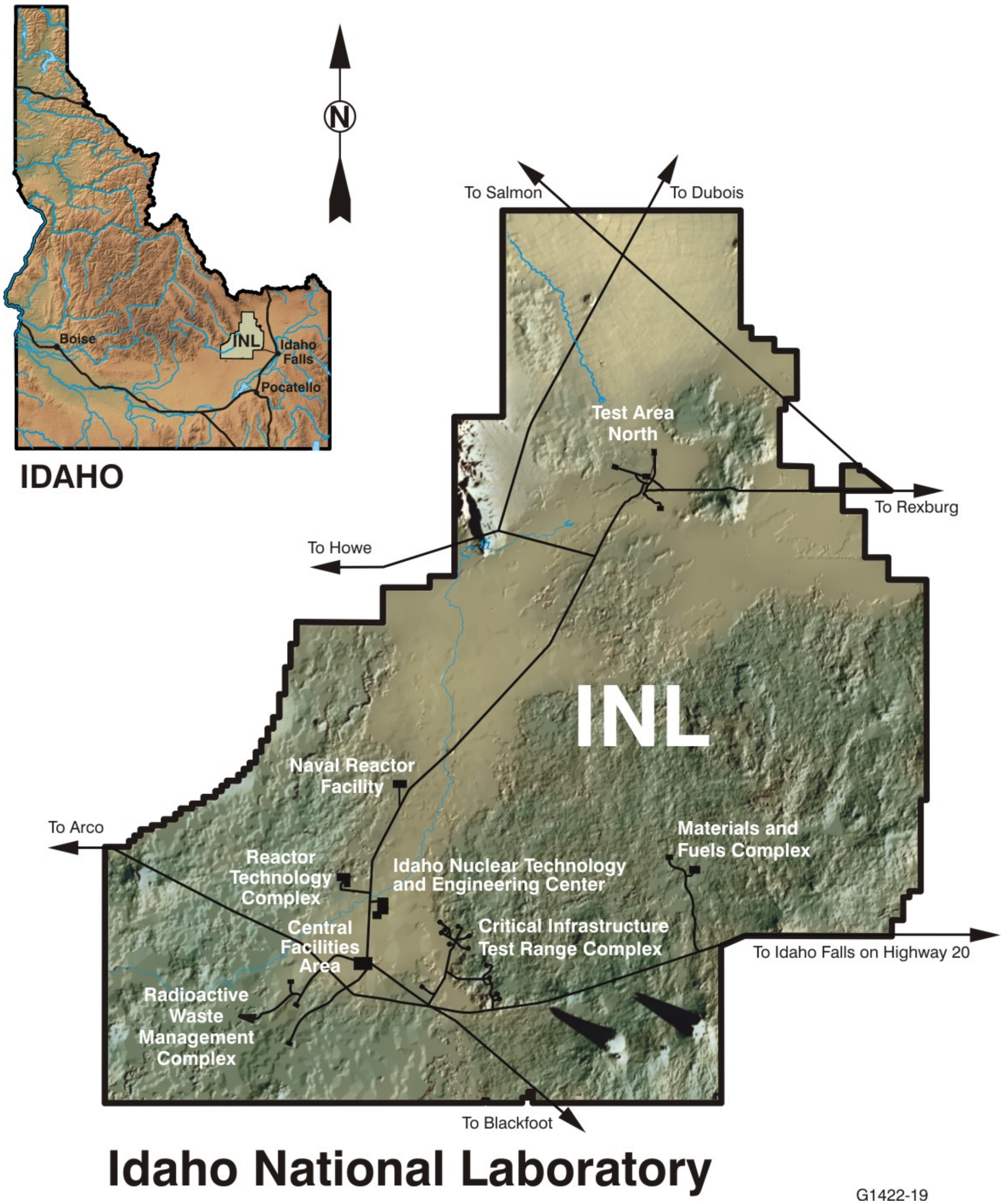

Figure A-1. Map showing location of INTEC at the INL.

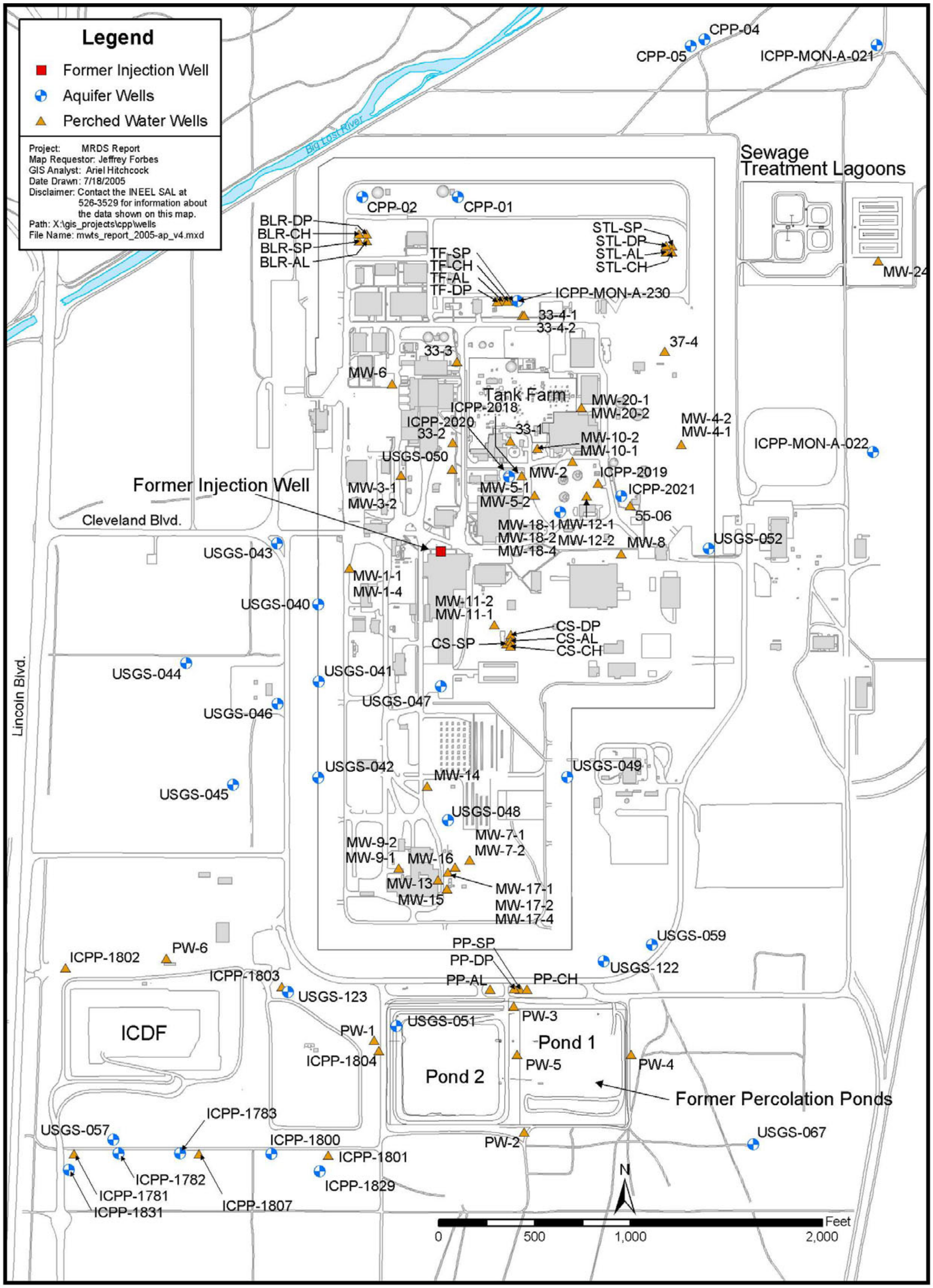

Figure A-2. INTEC monitoring well locations.

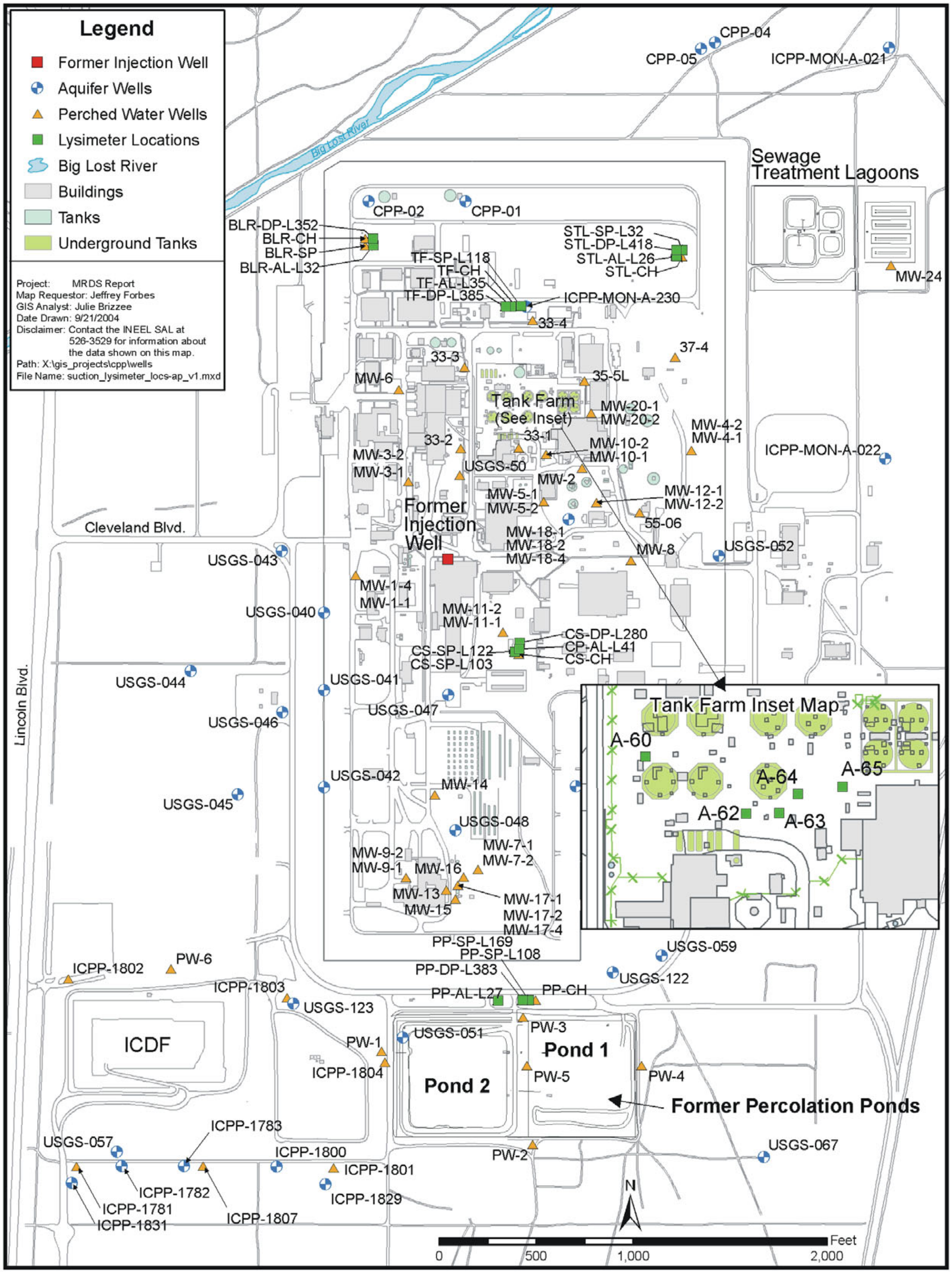

Figure A-3. INTEC suction lysimeter locations.

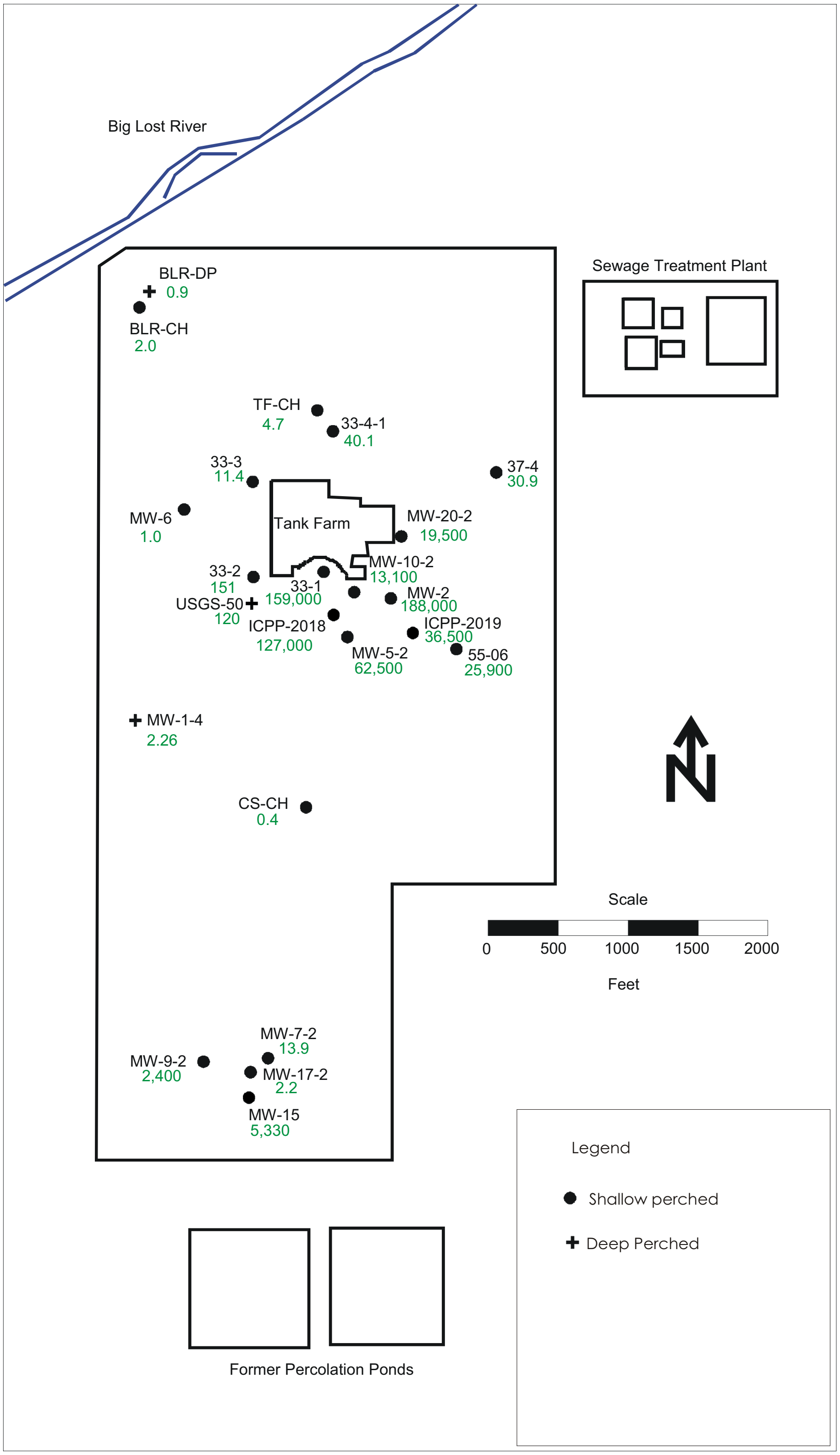

Figure A-4. Distribution of Sr-90 (pCi/L) in perched water in 2005.

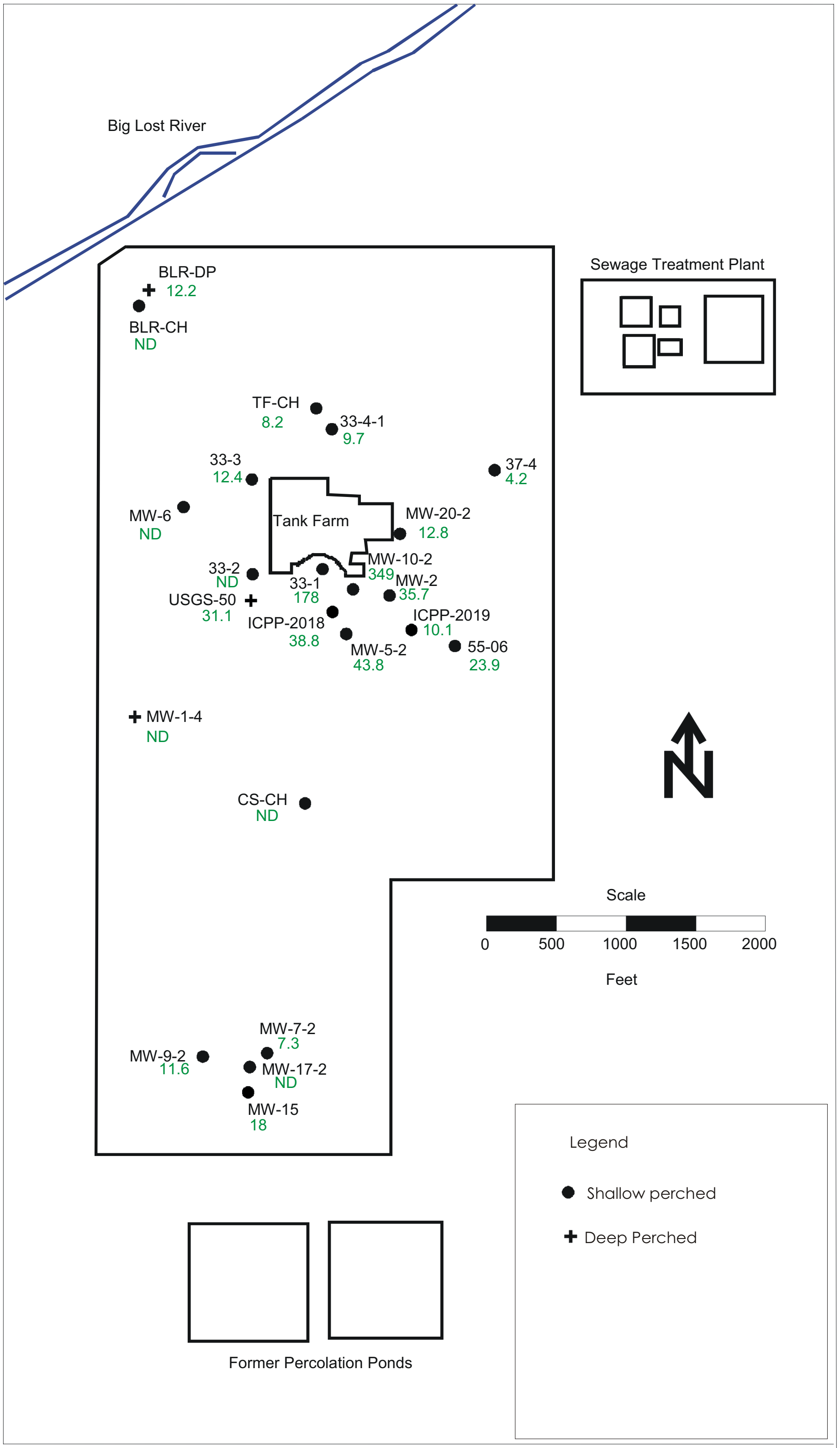

Figure A-5. Distribution of Tc-99 (pCi/L) in perched water in 2005.

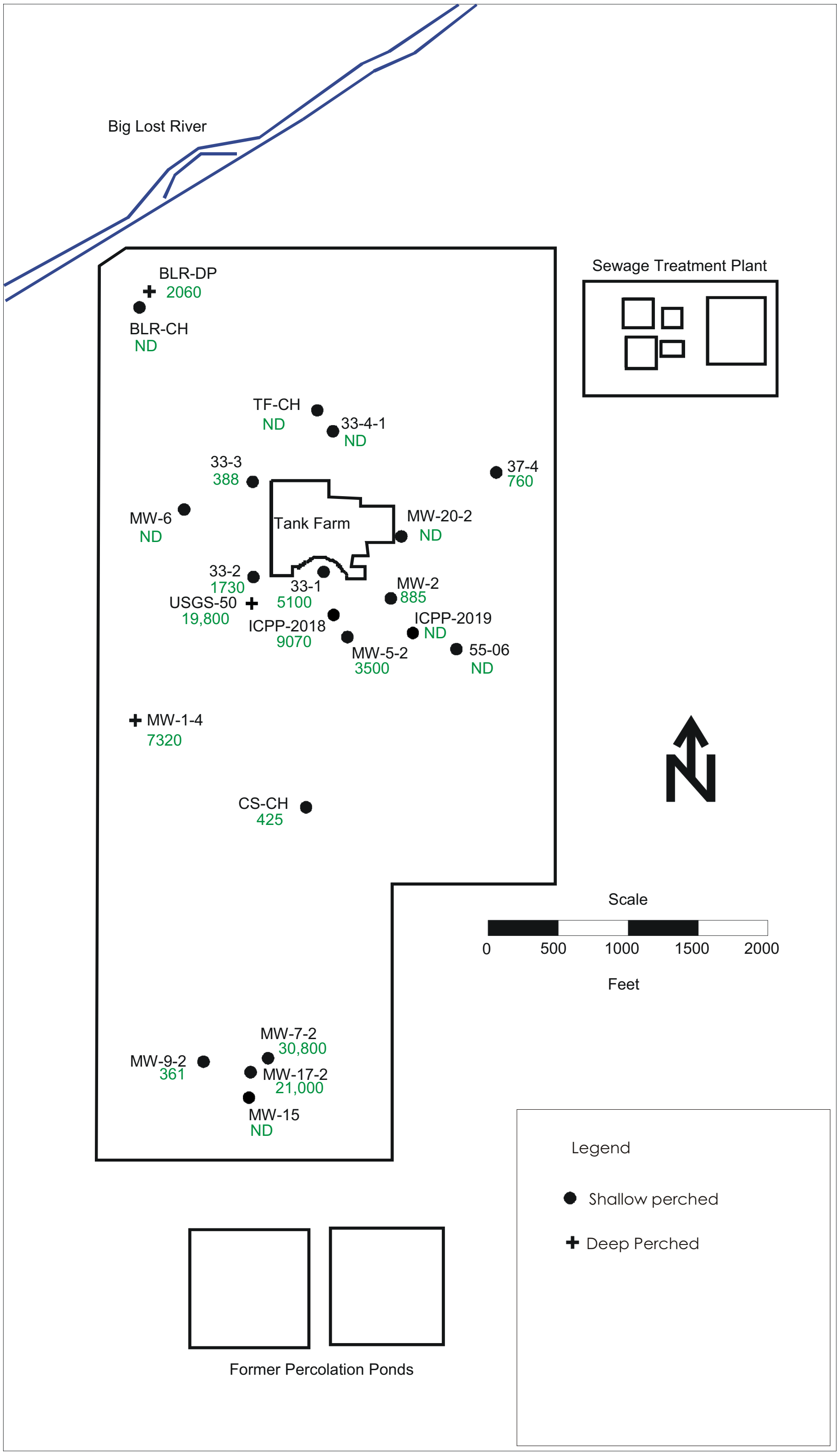

Figure A-6. Distribution of tritium (pCi/L) in perched water in 2005.

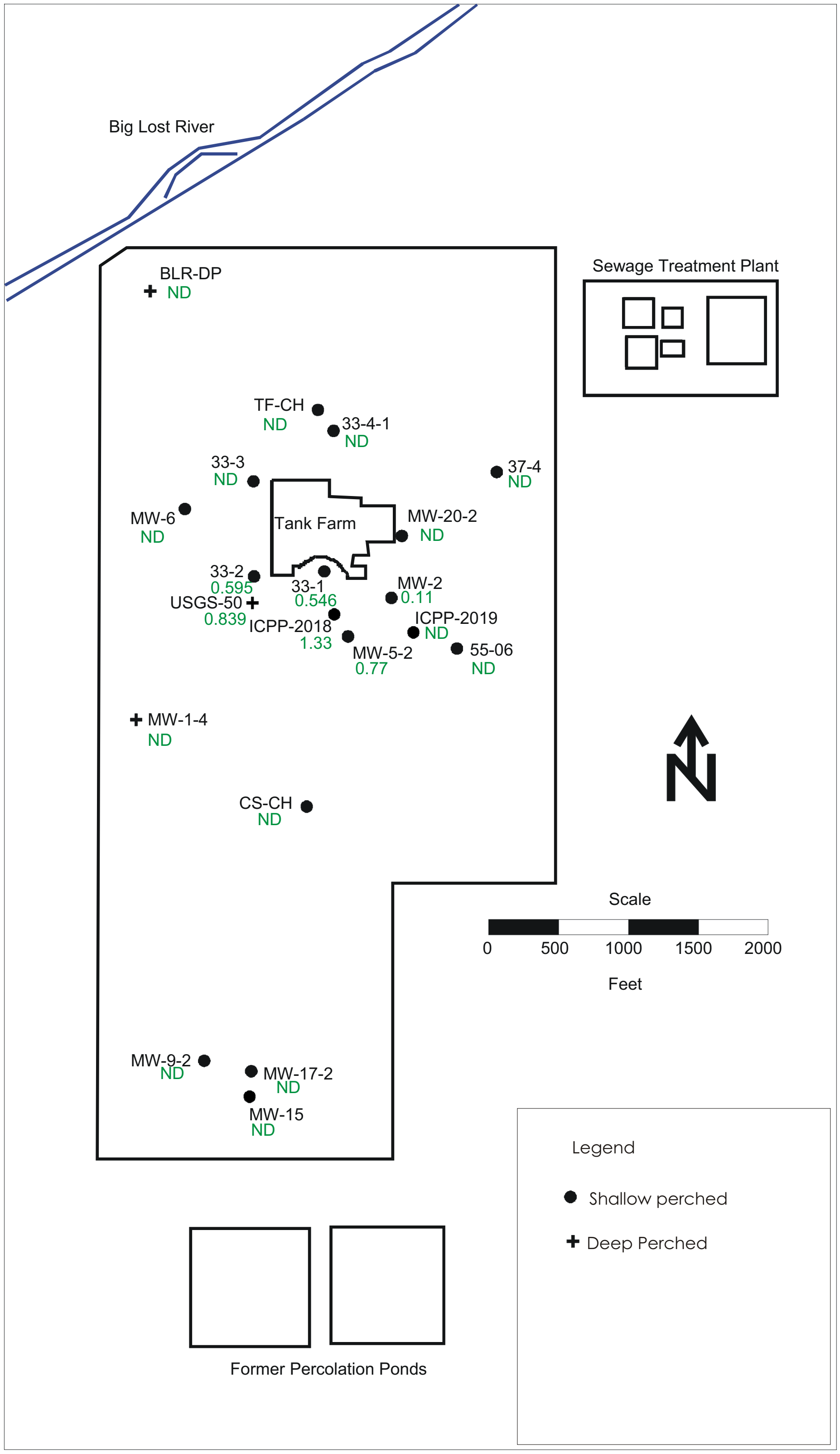

Figure A-7. Distribution of I-129 (pCi/L) in perched water in 2005.

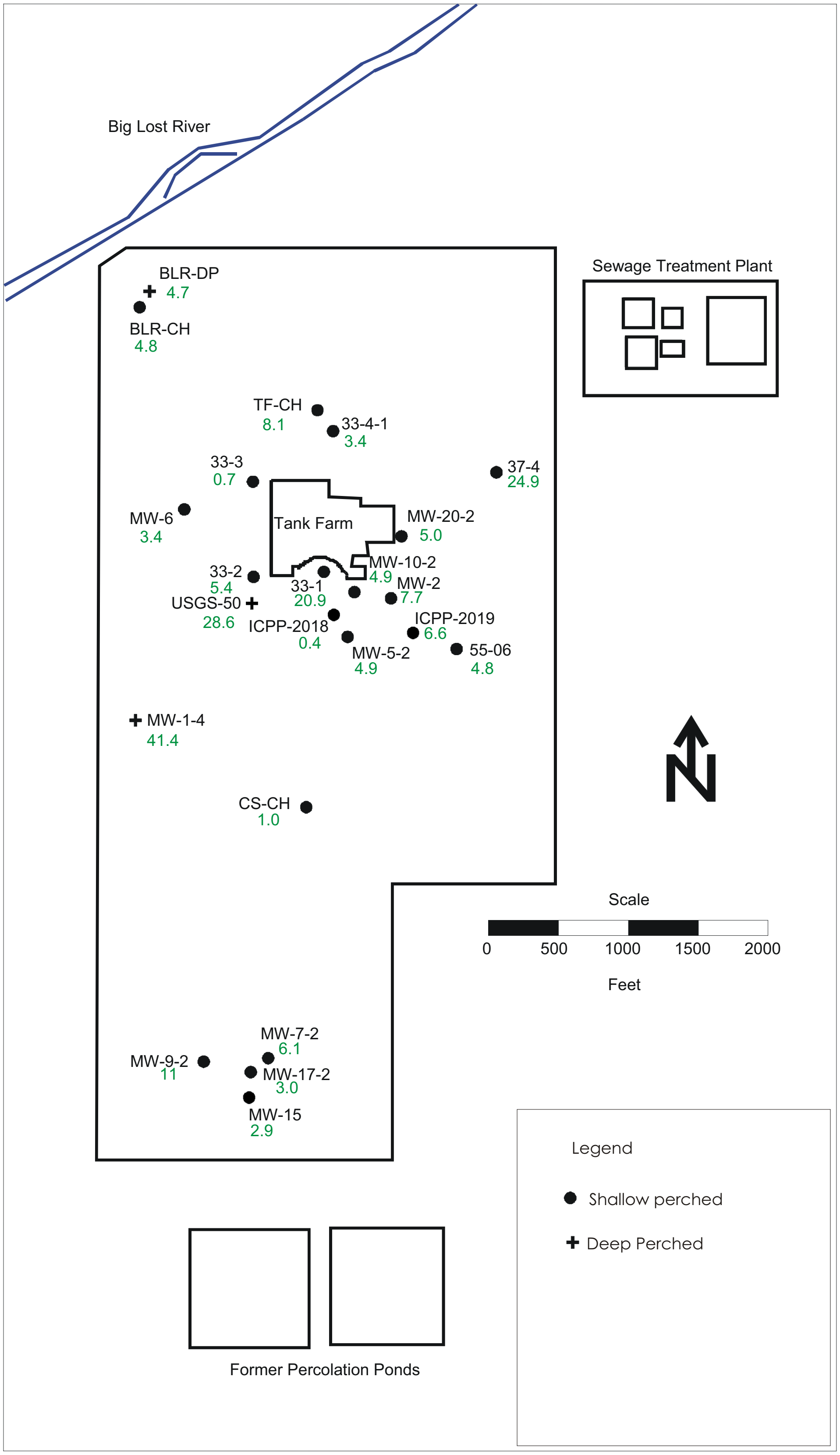

Figure A-8. Distribution of nitrate (mg/L-N) in perched water in 2005.

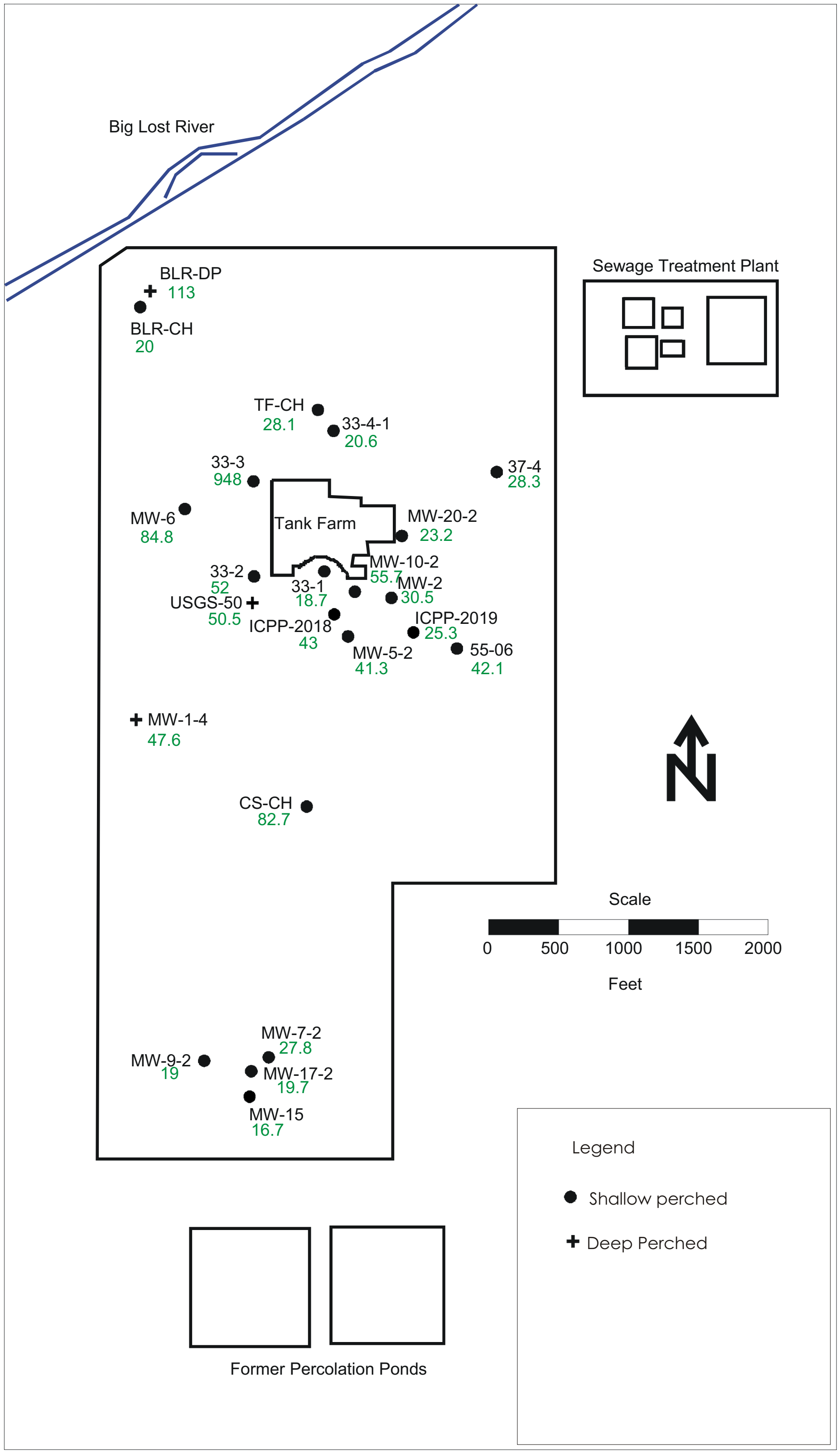

Figure A-9. Distribution of chloride (mg/L) in perched water in 2005.

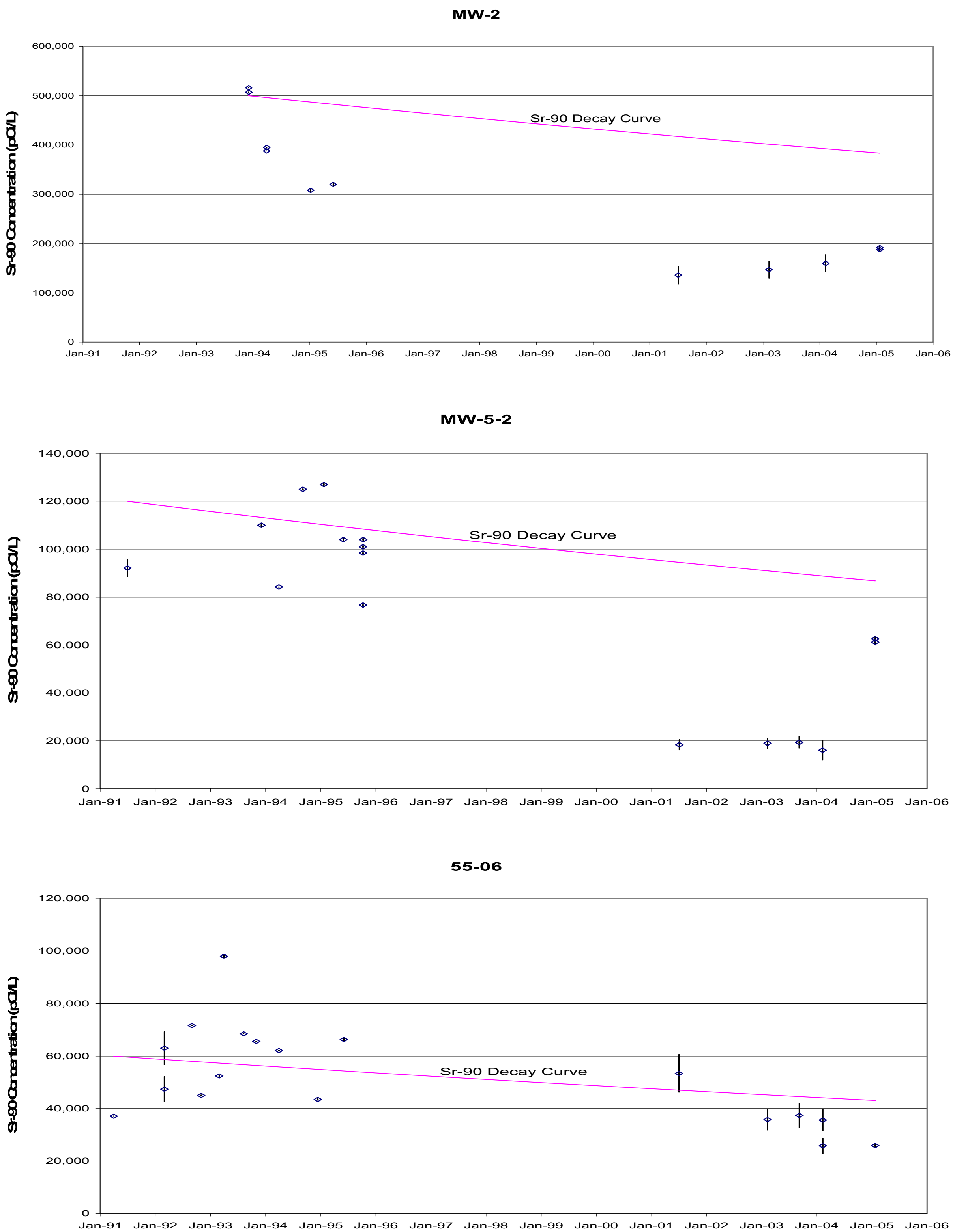

Figure A-10. Sr-90 concentration trends for selected wells in the northern shallow perched water.

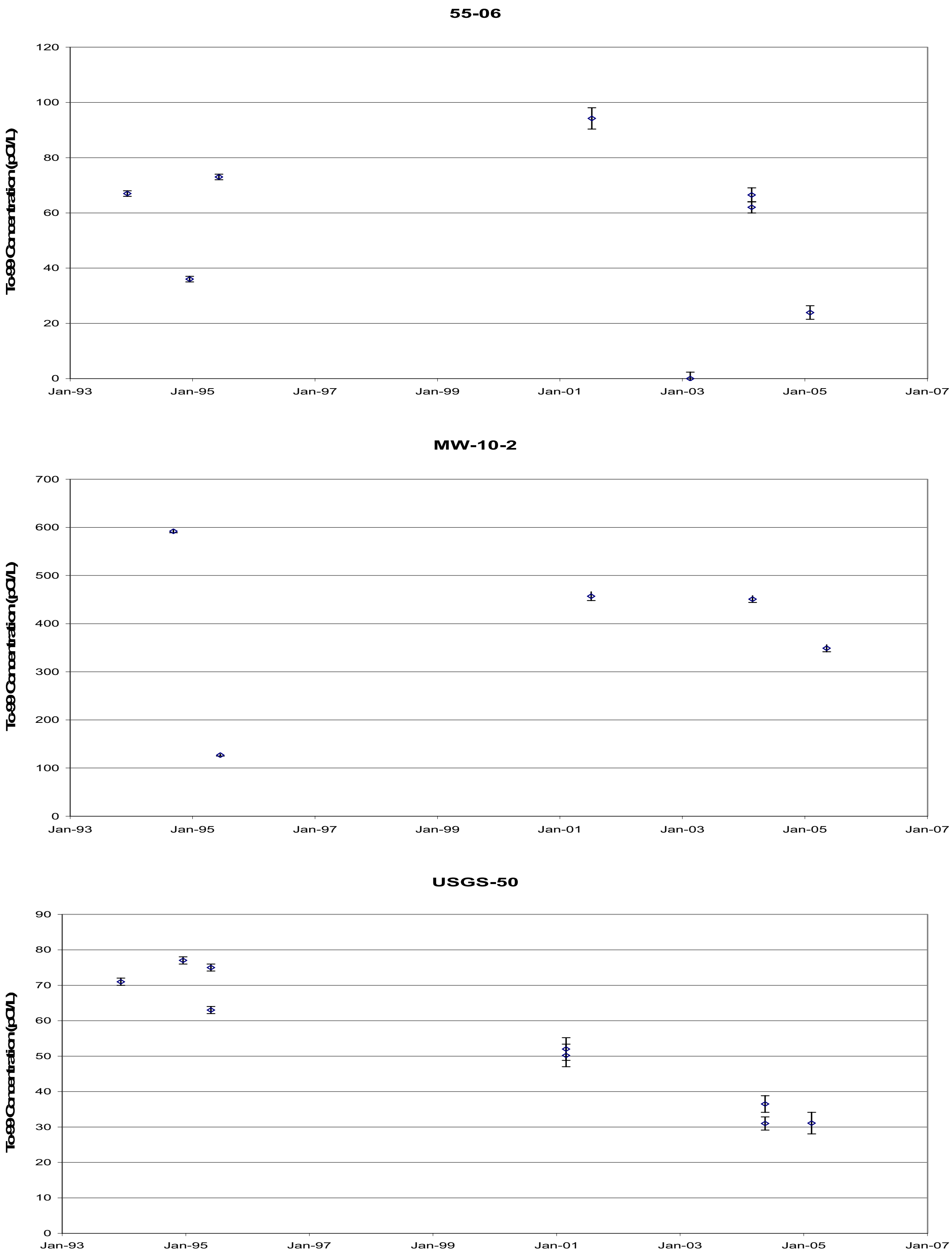

Figure A-11. Tc-99 concentration (pCi/L) trends for selected wells.

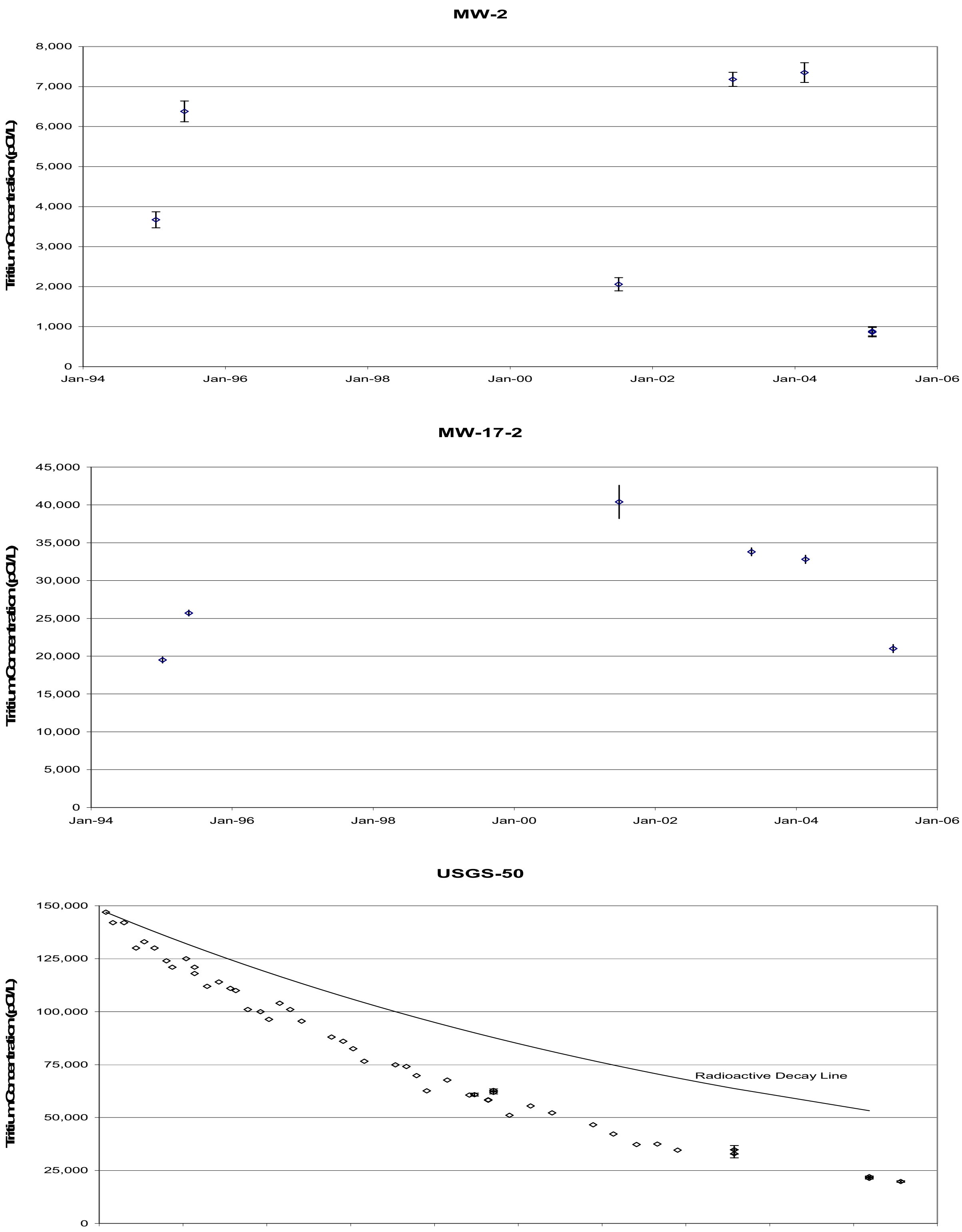

Figure A-12. Tritium concentration (pCi/L) trends for selected wells.

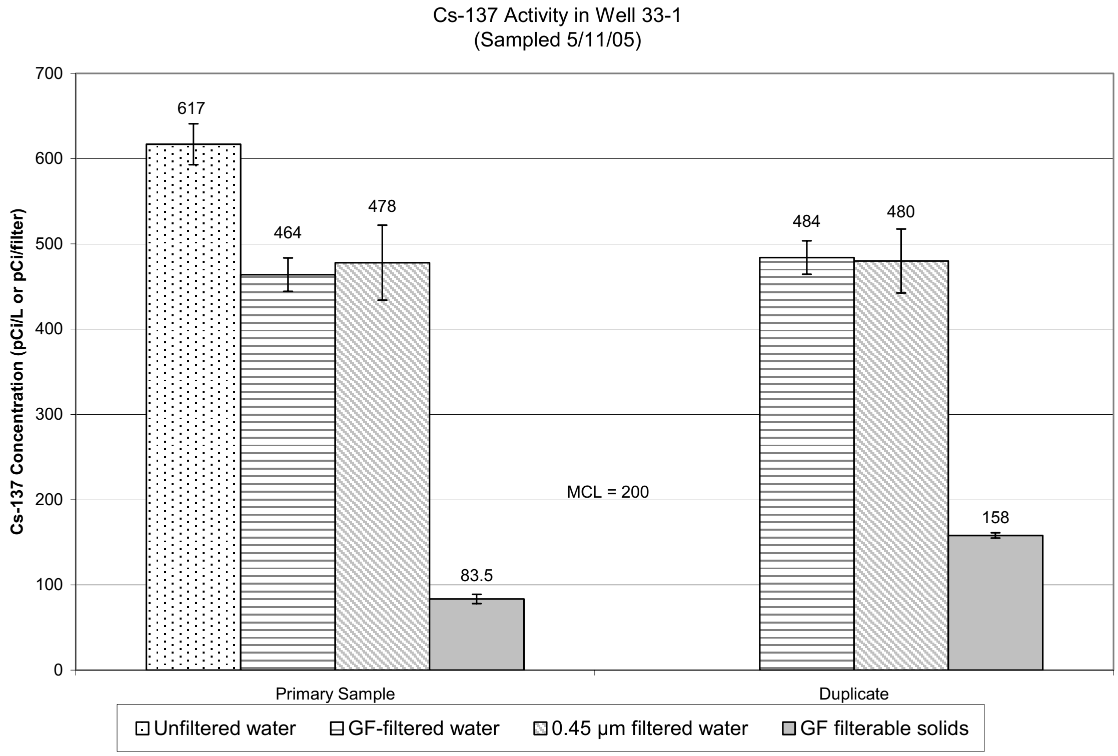

Figure A-13. Cs-137 concentration in Well 33-1.

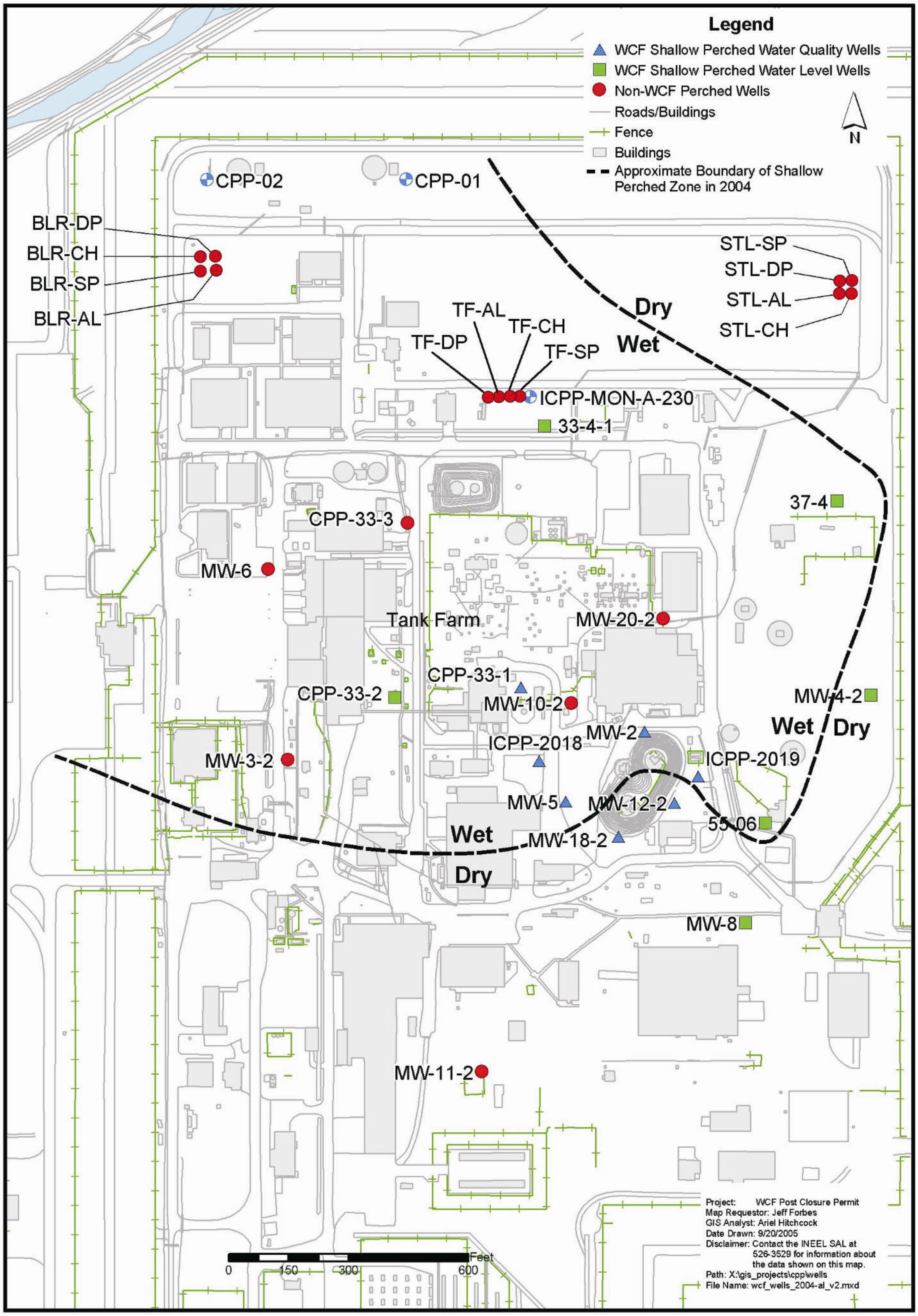

Figure A-14. Map showing lateral extent of northern shallow perched water zone during 2004 and 2005.

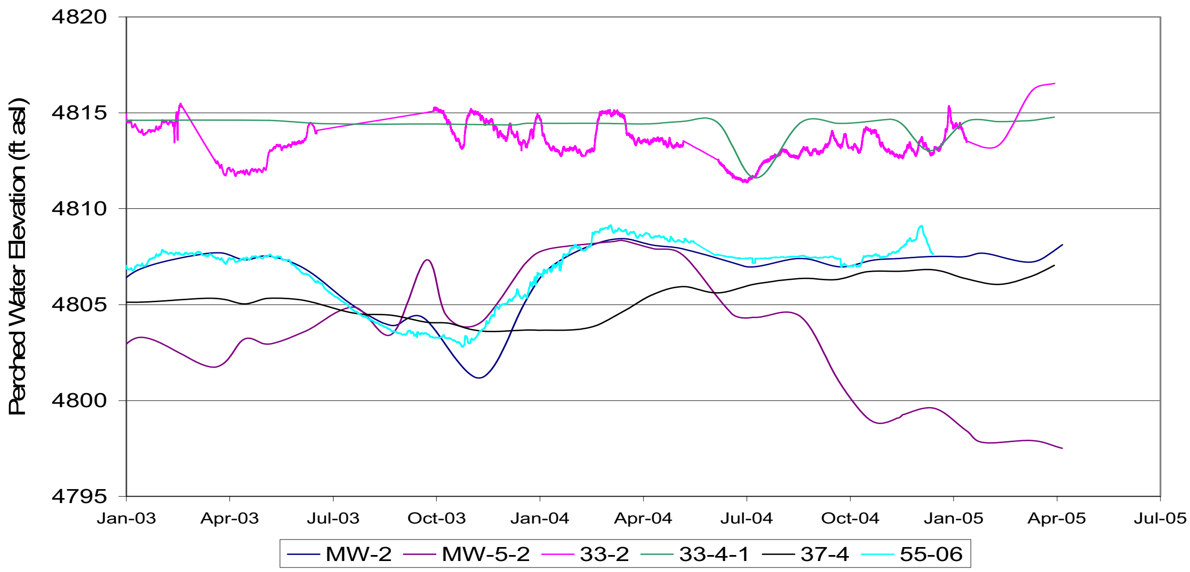

Figure A-15. Hydrographs for selected shallow perched wells.

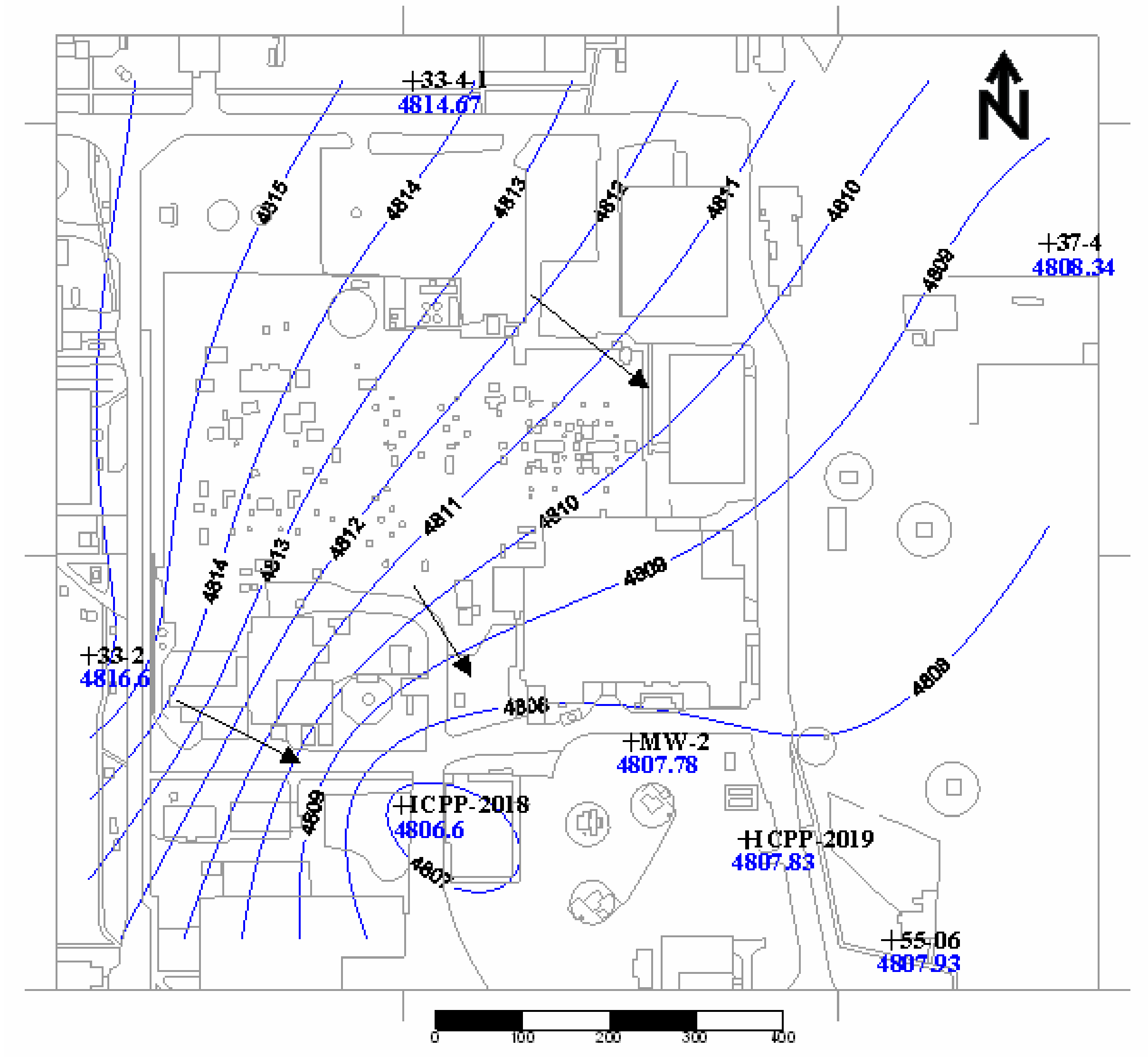

Figure A-16. Upper shallow perched water level contours for May 16, 2005.

110-ft Interbed Top Elevation (ft)

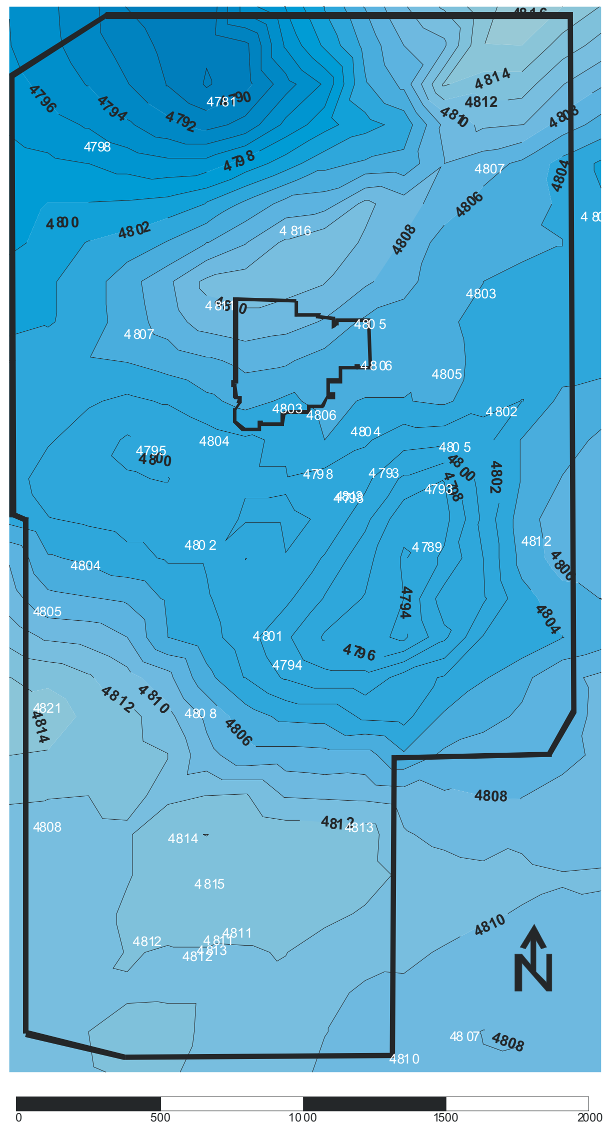

Figure A-17. Contour map of upper surface of 110-ft sedimentary interbed.

Appendix B

Tables

TABLES

Appendix B

Tables

Table B-1. 2005 summary of perched water samples and laboratory analytes.

Well Name	Depth	Sample Date	Alkalinity	Am-241	Anions	Gamma Spec	Gross Alpha	Gross Beta	I-129	Sr-90	Nitrate	Np-237	Pu-Iso	Tc-99	Tritium	U-Iso	Metals (Total)	Metals (Filtered)
33-1	89-99	5/11/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33-2	86-106	2/15/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33-3	112-122	2/09/05, 5/18/05[a]	X	Dry	X	Dry	Dry	Dry	X	X	X	Dry	Dry	X	X	Dry	X	X
33-4-1	98-118	2/21/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37-4	100-110	2/21/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55-06	93-113	2/01/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BLR-CH	120-130	2/8/05, 5/18/05[b]	X	Dry	X	Dry	Dry	Dry	Dry	X	X	Dry	Dry	X	X	Dry	Dry	X
BLR-DP	375-385	3/02/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CS-CH	188-189	2/22/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-1-4	326-336	5/18/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-2	102-112	2/01/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-3-2	128-138	NS	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW-5-2	106-126	2/01/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-6	117-137	2/09/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-7-2	132-142	2/09/05, 5/11/05[c]	X	Dry	X	Dry	Dry	Dry	Dry	X	X	Dry	Dry	X	X	Dry	X	X
MW-9-2	120-130	5/17/05, 5/18/05[d]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-10-2	141-151	2/2-3/05, 5/10/05[e]	X	Dry	X	Dry	Dry	Dry	Dry	X	X	Dry	Dry	X	Dry	Dry	X	X
MW-13	100-105	NS	See note															
MW-15	111-131	10/11/04	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-17-2	182-192	5/17/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-17-4	360-381	NS	See note															
MW-20-2	133-148	2/09/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-24	53-73	NS	See note															
PP-CH-2	235-255	NS	See note															
PW-1	100-120	NS	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
PW-2	111-131	NS	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
PW-3	103-123	NS	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
PW-4	110-150	NS	See note															
PW-5	109-129	NS	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
PW-6	105-125	NS	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
TF-CH	145-150	2/08/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICPP-2018	98-118	4/19/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ICPP-2019	95-120	4/19/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USGS-050	356-405	2/16/05	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table B-1. (continued).

Well Name	Depth	Sample Date	Alkalinity	Am-241	Anions	Gamma Spec	Gross Alpha	Gross Beta	I-129	Sr-90	Nitrate	Np-237	Pu-Iso	Tc-99	Tritium	U-Iso	Metals (Total)	Metals (Filtered)
Lysimeters																		
A-60-39	39	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry
A-62-41	41	5/23/05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
A-63-45	45	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
A-64-40	40	5/23/05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry
A-65-36	36	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	X
BLR-AL-L32	32.3	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
BLR-DP-L352	352	3/01/05	Dry	Dry	X	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	X	X	Dry	Dry	X
BLR-SP-L167	167	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	X
CS-AL-L41	40.9	5/23/05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry
CS-DP-L280	280	3/01/05	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
CS-SP-L122	122	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
CS-SP-L155	155	5/23/05	Dry	Dry	Dry	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
PP-AL-L27	26.6	5/23/05	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
PP-DP-L383	383	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry
PP-SP-L108	108.8	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
PP-SP-L169	169	3/01/05	Dry	Dry	X	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry
STL-AL-L26	26	5/23/05	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
STL-DP-L418	418	3/01/05	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
STL-SP-L103	103.3	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry
TF-AL-L35	35	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	X
TF-DP-L385	385	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	X	X	Dry	Dry	Dry
TF-SP-L118	118	3/01/05, 5/23/05[f]	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry	Dry	X	Dry	Dry	Dry

"Dry" means insufficient water available for laboratory analysis.

"NR" means analysis not requested for this constituent.

"NS" means not sampled. MW-13 was essentially dry (6 in. of wet mud at the bottom); MW-17-4 and MW-24 had insufficient water to reach surface; PP-CH-2 full of sand (well screen broken); PW-4 full of sediment (casing broken);

"X" means sample collected for that constituent.

a. Insufficient well yield to collect all samples. Well sampled on 5/18/05 for I-129; sampled on 2/09/05 for all other analytes.

b. Well sampled for tritium and inorganics on 2/8/05; sampled on 5/18/05 for tritium and all other radionuclides.

c. Well sampled February 2005 for all analytes; resampled in May 2005 for Sr-90 and Tc-99 only.

d. Well sampled 5/18/05 for I-129, Sr-90, Tc-99 and inorganics; sampled on 5/17/05 for all other analytes.

e. Well sampled 2/2-3/05 for inorganics; sampled on 5/10/05 for all other analytes.

f. Lysimeter sampled 3/01/05 and 5/23/05. Refer to data CD for which sample date applies to each analyte.

Table B-2. 2005 perched water field parameter results.

Well ID	Screened Interval (ft bgs)	Date	Temperature (ºC)	pH	EC (mS/cm)	DO (mg/L)	ORP (mV)
33-1	89-99	5/11/05	14.47	8.14	0.749	5.95	179
33-2	86-106	2/15/05	17.41	7.55	0.598	4.29	166
33-3	112-122	5/18/05	19.22	7.45	8.69	6.03	121
33-4-1	98-118	2/21/05	13.40	7.40	0.461	3.21	154
37-4	100-110	2/21/05	14.01	7.66	0.797	3.36	163
55-06	93-113	2/01/05	12.35	7.34	0.563	4.19	197
BLR-CH	120-130	5/18/05	11.02	8.38	0.396	3.94	118
BLR-DP	375-385	3/02/05	7.33	7.89	0.920	9.81	156
CS-CH	188-198	2/22/05	11.60	7.79	0.570	3.31	125
MW-1-4	326-336	5/18/05	13.85	7.46	0.859	5.89	194
MW-2	102-112	2/01/05	16.17	7.19	0.612	2.42	189
MW-5-2	106-126	2/01/05	19.25	7.10	0.871	3.80	216
MW-6	117-137	2/09/05	19.41	7.35	0.710	3.47	139
MW-7-2	132-142	5/10/05	14.1	7.92	0.549	6.42	176
MW-9-2	120-130	5/17/05	20.82	7.87	0.505	6.30	187
MW-10-2	141-151	5/10/05	16.31	7.45	0.861	5.87	182
MW-15	111-131	10/11/04	17.36	7.78	0.427	6.22	378
MW-17-2	182-192	5/17/05	17.00	9.58	0.521	2.97	169
MW-20-2	133-148	2/09/05	15.34	7.53	0.565	4.25	146
TF-CH	145-150	2/08/05	10.15	7.39	0.621	3.91	156
ICPP-2018	98-118	5/03/05	21.69	7.20	0.877	1.24	-22
ICPP-2019	95-120	5/03/05	14.89	7.42	0.527	7.10	172
USGS-050	357-405	2/16/05	16.71	7.75	0.722	3.31	184

EC = electrical conductivity

DO = dissolved oxygen

ORP = oxidation-reduction potential

Note: Field parameters measured using Hydrolab instrument at the wellhead following purging. Temperature values may differ from in-situ perched water temperatures as a result of temperature changes at the ground surface.

Table B-3. 2004 concentrations of radionuclides in perched water.

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
Perched Water Monitoring Wells					
33-1	05/11/05	Americium-241	-10.1	3.67	U
33-2	02/15/05	Americium-241	0.0135	0.0326	U
33-4-1	02/21/05	Americium-241	0.0071	0.0309	U
37-4	02/21/05	Americium-241	-0.0159	0.029	U
55-06	02/01/05	Americium-241	0.0294	0.0209	U
BLR-DP	03/02/05	Americium-241	0.0423	0.0423	U
CS-CH	02/22/05	Americium-241	0.018	0.0436	U
MW-1-4	05/18/05	Americium-241	0.0873	0.0313	J
MW-15	10/11/04	Americium-241	-11.6	12.4	U
MW-15	10/11/04	Americium-241	0.0366	0.0351	U
MW-15	10/11/04	Americium-241	0.0057	0.0295	U
MW-17-2	05/17/05	Americium-241	0.0481	0.0256	U
MW-2	02/01/05	Americium-241	0.0611	0.0408	U
MW-2	02/01/05	Americium-241	-0.000277	0.0241	U
MW-20-2	02/09/05	Americium-241	0.0358	0.0315	U
MW-5-2	02/01/05	Americium-241	0.066	0.0339	U
MW-5-2	02/01/05	Americium-241	0.0573	0.0408	U
MW-6	02/09/05	Americium-241	0.0209	0.0273	U
MW-9-2	05/17/05	Americium-241	-0.016	0.0196	U
TF-CH	02/08/05	Americium-241	-0.014	0.0256	U
ICPP-2019	04/19/05	Americium-241	-0.00916	0.0065	U
ICPP-2018	04/19/05	Americium-241	0.0627	0.0364	U
USGS-050	02/16/05	Americium-241	0.0154	0.0154	U
33-1	05/11/05	Antimony-125	-2.58	9.26	U
33-2	02/15/05	Antimony-125	11.2	6.72	U
33-4-1	02/21/05	Antimony-125	-4.35	7.64	U
37-4	02/21/05	Antimony-125	23.6	8.07	UJ
55-06	02/01/05	Antimony-125	1.09	6.27	U
BLR-DP	03/02/05	Antimony-125	-4.41	2.98	U
CS-CH	02/22/05	Antimony-125	-0.485	6.98	U
MW-1-4	05/18/05	Antimony-125	0.0372	4.93	U
MW-15	10/11/04	Antimony-125	4.1	6.43	U
MW-15	10/11/04	Antimony-125	-1.38	7.78	U
MW-17-2	05/17/05	Antimony-125	9.22	8.7	U
MW-2	02/01/05	Antimony-125	-2.51	7.43	U
MW-2	02/01/05	Antimony-125	2.73	10.3	U
MW-20-2	02/09/05	Antimony-125	0.179	4.35	U
MW-5-2	02/01/05	Antimony-125	6.16	4.86	U
MW-5-2	02/01/05	Antimony-125	0.825	5.64	U
MW-6	02/09/05	Antimony-125	-1.2	4.44	U
MW-9-2	05/17/05	Antimony-125	-5.67	7.26	U
TF-CH	02/08/05	Antimony-125	-5.15	3.75	U
ICPP-2019	04/19/05	Antimony-125	-3.87	5.62	U
ICPP-2018	04/19/05	Antimony-125	-1.43	4.82	U
USGS-050	02/16/05	Antimony-125	-1.55	3.19	U
33-1	05/11/05	Cerium-144	-8.25	37.2	U
33-2	02/15/05	Cerium-144	5.03	10.5	U
33-4-1	02/21/05	Cerium-144	9.46	16.6	U
37-4	02/21/05	Cerium-144	11.6	16	U
55-06	02/01/05	Cerium-144	-25.8	22.6	U
BLR-DP	03/02/05	Cerium-144	8.4	7.69	U
CS-CH	02/22/05	Cerium-144	-8.53	17.6	U
MW-1-4	05/18/05	Cerium-144	4.9	14.3	U
MW-15	10/11/04	Cerium-144	21.6	16	U
MW-15	10/11/04	Cerium-144	26.1	16.4	U
MW-17-2	05/17/05	Cerium-144	-7.64	21.4	U
MW-2	02/01/05	Cerium-144	-80.9	44.7	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
MW-2	02/01/05	Cerium-144	75	68.3	U
MW-20-2	02/09/05	Cerium-144	-2.24	19.5	U
MW-5-2	02/01/05	Cerium-144	7.98	25.4	U
MW-5-2	02/01/05	Cerium-144	22.9	24	U
MW-6	02/09/05	Cerium-144	0.177	12.1	U
MW-9-2	05/17/05	Cerium-144	6.76	19.2	U
TF-CH	02/08/05	Cerium-144	-5.67	11	U
ICPP-2019	04/19/05	Cerium-144	35.7	22.6	U
ICPP-2018	04/19/05	Cerium-144	-6.78	22.8	U
USGS-050	02/16/05	Cerium-144	-11	9.01	U
33-1	05/11/05	Cesium-134	0.614	2.6	U
33-2	02/15/05	Cesium-134	0.986	1.46	U
33-4-1	02/21/05	Cesium-134	-1.76	2.66	U
37-4	02/21/05	Cesium-134	-0.113	3.11	U
55-06	02/01/05	Cesium-134	0.955	2	U
BLR-DP	03/02/05	Cesium-134	-1.32	1.03	U
CS-CH	02/22/05	Cesium-134	-3.77	4.29	U
MW-1-4	05/18/05	Cesium-134	-2.4	1.94	U
MW-15	10/11/04	Cesium-134	-3.27	2.78	U
MW-15	10/11/04	Cesium-134	2.63	2.64	U
MW-17-2	05/17/05	Cesium-134	4	2.51	U
MW-2	02/01/05	Cesium-134	-1.06	2.2	U
MW-2	02/01/05	Cesium-134	-1.2	2.92	U
MW-20-2	02/09/05	Cesium-134	0.883	1.63	U
MW-5-2	02/01/05	Cesium-134	1.9	1.49	U
MW-5-2	02/01/05	Cesium-134	2.17	2.35	U
MW-6	02/09/05	Cesium-134	0.561	1.57	U
MW-9-2	05/17/05	Cesium-134	-1.07	2.83	U
TF-CH	02/08/05	Cesium-134	1.54	1.44	U
ICPP-2019	04/19/05	Cesium-134	2.15	2.05	U
ICPP-2018	04/19/05	Cesium-134	2.26	1.6	U
USGS-050	02/16/05	Cesium-134	1.85	0.818	UJ
33-1	05/11/05	Cesium-137	617	24	
33-2	02/15/05	Cesium-137	1.65	1.2	U
33-4-1	02/21/05	Cesium-137	-1.28	2.35	U
37-4	02/21/05	Cesium-137	1.27	2.83	U
55-06	02/01/05	Cesium-137	2.26	4.56	U
BLR-DP	03/02/05	Cesium-137	0.57	1.08	U
CS-CH	02/22/05	Cesium-137	-3.27	2.85	U
MW-1-4	05/18/05	Cesium-137	2.4	2.16	U
MW-15	10/11/04	Cesium-137	3.9	6.97	U
MW-15	10/11/04	Cesium-137	1.21	2.6	U
MW-17-2	05/17/05	Cesium-137	-1.88	2.74	U
MW-2	02/01/05	Cesium-137	0.511	2.28	U
MW-2	02/01/05	Cesium-137	-1.82	3.14	U
MW-20-2	02/09/05	Cesium-137	1.79	1.27	U
MW-5-2	02/01/05	Cesium-137	1.26	1.75	U
MW-5-2	02/01/05	Cesium-137	-0.524	2.12	U
MW-6	02/09/05	Cesium-137	0.307	1.68	U
MW-9-2	05/17/05	Cesium-137	0.23	3.26	U
TF-CH	02/08/05	Cesium-137	-1.06	1.46	U
ICPP-2019	04/19/05	Cesium-137	1.84	1.98	U
ICPP-2018	04/19/05	Cesium-137	5.34	3.48	U
USGS-050	02/16/05	Cesium-137	2.97	1.49	U
33-1	05/11/05	Cobalt-60	2.36	2.17	U
33-2	02/15/05	Cobalt-60	3.53	1.65	UJ
33-4-1	02/21/05	Cobalt-60	1.64	2.51	U
37-4	02/21/05	Cobalt-60	2.34	2.95	U
55-06	02/01/05	Cobalt-60	1.99	1.7	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
BLR-DP	03/02/05	Cobalt-60	0.153	0.817	U
CS-CH	02/22/05	Cobalt-60	-7.55	4.41	U
MW-1-4	05/18/05	Cobalt-60	0.102	2.51	U
MW-15	10/11/04	Cobalt-60	0.381	2.37	U
MW-15	10/11/04	Cobalt-60	10.4	3.35	
MW-17-2	05/17/05	Cobalt-60	0.923	4	U
MW-2	02/01/05	Cobalt-60	0.704	1.37	U
MW-2	02/01/05	Cobalt-60	-1	2	U
MW-20-2	02/09/05	Cobalt-60	4.19	1.58	UJ
MW-5-2	02/01/05	Cobalt-60	-0.0957	1.31	U
MW-5-2	02/01/05	Cobalt-60	0.0403	1.79	U
MW-6	02/09/05	Cobalt-60	-0.14	1.39	U
MW-9-2	05/17/05	Cobalt-60	0.32	2.7	U
TF-CH	02/08/05	Cobalt-60	2.52	1.66	U
ICPP-2019	04/19/05	Cobalt-60	4.27	2.36	U
ICPP-2018	04/19/05	Cobalt-60	3.15	1.25	UJ
USGS-050	02/16/05	Cobalt-60	0.711	1.2	U
33-1	05/11/05	Europium-152	-1.41	10.5	U
33-2	02/15/05	Europium-152	-0.657	4.14	U
33-4-1	02/21/05	Europium-152	-7.67	7.65	U
37-4	02/21/05	Europium-152	-6.44	6.43	U
55-06	02/01/05	Europium-152	-4.22	6.78	U
BLR-DP	03/02/05	Europium-152	-5.04	3.11	U
CS-CH	02/22/05	Europium-152	-5.01	6.84	U
MW-1-4	05/18/05	Europium-152	0.879	5.65	U
MW-15	10/11/04	Europium-152	0.948	6.38	U
MW-15	10/11/04	Europium-152	1.79	6.67	U
MW-17-2	05/17/05	Europium-152	-17	9.53	U
MW-2	02/01/05	Europium-152	13.9	9.46	U
MW-2	02/01/05	Europium-152	-7.24	12.9	U
MW-20-2	02/09/05	Europium-152	1.13	5.02	U
MW-5-2	02/01/05	Europium-152	-2.56	5.93	U
MW-5-2	02/01/05	Europium-152	2.04	6.1	U
MW-6	02/09/05	Europium-152	-11.4	5.39	U
MW-9-2	05/17/05	Europium-152	-11.4	8.1	U
TF-CH	02/08/05	Europium-152	-5.24	4.2	U
ICPP-2019	04/19/05	Europium-152	-6.51	6.08	U
ICPP-2018	04/19/05	Europium-152	-5.57	6.1	U
USGS-050	02/16/05	Europium-152	-0.118	3.32	U
33-1	05/11/05	Europium-154	13.2	5.8	UJ
33-2	02/15/05	Europium-154	-6.31	3.69	U
33-4-1	02/21/05	Europium-154	-1.89	6.92	U
37-4	02/21/05	Europium-154	-6.2	5.61	U
55-06	02/01/05	Europium-154	-3.43	4.71	U
BLR-DP	03/02/05	Europium-154	0.381	2.98	U
CS-CH	02/22/05	Europium-154	11.9	9.32	U
MW-1-4	05/18/05	Europium-154	-3.12	6.87	U
MW-15	10/11/04	Europium-154	1.5	7.47	U
MW-15	10/11/04	Europium-154	-1.47	7.17	U
MW-17-2	05/17/05	Europium-154	-15.9	12	U
MW-2	02/01/05	Europium-154	0.302	3.68	U
MW-2	02/01/05	Europium-154	-17.4	7.87	U
MW-20-2	02/09/05	Europium-154	-7.35	3.58	U
MW-5-2	02/01/05	Europium-154	-1.18	3.58	U
MW-5-2	02/01/05	Europium-154	6.65	6.05	U
MW-6	02/09/05	Europium-154	-8.35	4.99	U
MW-9-2	05/17/05	Europium-154	-11.1	8.53	U
TF-CH	02/08/05	Europium-154	-6	3.35	U
ICPP-2019	04/19/05	Europium-154	2.45	5.09	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
ICPP-2018	04/19/05	Europium-154	-0.472	3.53	U
USGS-050	02/16/05	Europium-154	1.33	2.93	U
33-1	05/11/05	Europium-155	-24.8	23.3	U
33-2	02/15/05	Europium-155	-4.75	5.52	U
33-4-1	02/21/05	Europium-155	-16.3	9.92	U
37-4	02/21/05	Europium-155	12	9.19	U
55-06	02/01/05	Europium-155	6.1	13.9	U
BLR-DP	03/02/05	Europium-155	-2.07	4.14	U
CS-CH	02/22/05	Europium-155	-4.4	8.15	U
MW-1-4	05/18/05	Europium-155	11	10.5	U
MW-15	10/11/04	Europium-155	-9.23	8.59	U
MW-15	10/11/04	Europium-155	18.3	13.1	U
MW-17-2	05/17/05	Europium-155	29	12.5	UJ
MW-2	02/01/05	Europium-155	-1.65	27	U
MW-2	02/01/05	Europium-155	-28.7	41.4	U
MW-20-2	02/09/05	Europium-155	-5.69	11.9	U
MW-5-2	02/01/05	Europium-155	1.5	16.1	U
MW-5-2	02/01/05	Europium-155	16.5	13.5	U
MW-6	02/09/05	Europium-155	5.25	6.57	U
MW-9-2	05/17/05	Europium-155	-2.11	11.9	U
TF-CH	02/08/05	Europium-155	1.24	5.71	U
ICPP-2019	04/19/05	Europium-155	9.02	13.8	U
ICPP-2018	04/19/05	Europium-155	-13.2	14.2	U
USGS-050	02/16/05	Europium-155	18	6.87	UJ
33-1	05/11/05	Gross alpha	9330	2210	R
33-2	02/15/05	Gross alpha	10.2	3.08	
33-4-1	02/21/05	Gross alpha	4.31	0.802	J
37-4	02/21/05	Gross alpha	5.15	0.967	J
55-06	02/01/05	Gross alpha	10.7	1.23	
BLR-DP	03/02/05	Gross alpha	-0.715	0.304	UJ
CS-CH	02/22/05	Gross alpha	37.2	2.94	J
MW-1-4	05/18/05	Gross alpha	7.11	1.03	R
MW-1-4	05/19/05	Gross alpha	2.88	0.56	
MW-15	10/11/04	Gross alpha	5.51	0.789	
MW-15	10/11/04	Gross alpha	10	1.13	
MW-17-2	05/17/05	Gross alpha	147	9.22	R
MW-17-2	05/17/05	Gross alpha	31.8	2.15	
MW-2	02/01/05	Gross alpha	10.5	1.23	
MW-2	02/01/05	Gross alpha	5.03	0.829	
MW-20-2	02/09/05	Gross alpha	3.36	0.677	
MW-5-2	02/01/05	Gross alpha	4.62	0.79	
MW-5-2	02/01/05	Gross alpha	2.65	0.621	
MW-6	02/09/05	Gross alpha	4.94	0.842	
MW-9-2	05/17/05	Gross alpha	89.7	6.52	R
MW-9-2	05/17/05	Gross alpha	20.5	1.32	J
TF-CH	02/08/05	Gross alpha	5.61	1.07	
ICPP-2019	04/19/05	Gross alpha	3.94	1.36	UJ
ICPP-2018	04/19/05	Gross alpha	3.2	0.747	
USGS-050	02/16/05	Gross alpha	15.9	2.21	
33-1	05/11/05	Gross beta	383000	8830	
33-2	02/15/05	Gross beta	271	4.38	
33-4-1	02/21/05	Gross beta	99.3	2.79	J
37-4	02/21/05	Gross beta	79.5	2.53	J
55-06	02/01/05	Gross beta	45600	483	
BLR-DP	03/02/05	Gross beta	6.28	0.872	J
CS-CH	02/22/05	Gross beta	52.6	2.47	J
MW-1-4	05/18/05	Gross beta	19.5	1.41	
MW-1-4	05/19/05	Gross beta	20	0.976	
MW-15	10/11/04	Gross beta	10200	130	

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
MW-15	10/11/04	Gross beta	10100	219	
MW-17-2	05/17/05	Gross beta	8890	168	
MW-17-2	05/17/05	Gross beta	49.9	2.14	
MW-2	02/01/05	Gross beta	392000	1800	
MW-2	02/01/05	Gross beta	371000	1910	
MW-20-2	02/09/05	Gross beta	45400	434	
MW-5-2	02/01/05	Gross beta	157000	1090	
MW-5-2	02/01/05	Gross beta	147000	883	
MW-6	02/09/05	Gross beta	7.27	0.699	
MW-9-2	05/17/05	Gross beta	5890	112	
MW-9-2	05/17/05	Gross beta	5110	57.1	J
TF-CH	02/08/05	Gross beta	14.1	0.929	
ICPP-2019	04/19/05	Gross beta	69300	1470	
ICPP-2018	04/19/05	Gross beta	329000	10000	
USGS-050	02/16/05	Gross beta	241	3.58	
33-1	02/15/05	Iodine-129	0.546	0.0633	
33-2	02/15/05	Iodine-129	0.595	0.0728	
33-3	05/18/05	Iodine-129	0.00676	0.0183	U
33-4-1	02/21/05	Iodine-129	0.0484	0.0209	UJ
37-4	02/21/05	Iodine-129	0.0197	0.0121	U
55-06	02/01/05	Iodine-129	-0.00228	0.02	UJ
BLR-DP	03/02/05	Iodine-129	-0.0102	0.0211	U
CS-CH	02/22/05	Iodine-129	-0.0045	0.0175	U
MW-1-4	05/18/05	Iodine-129	0.0621	0.0306	UJ
MW-15	10/11/04	Iodine-129	0.00968	0.0224	U
MW-15	10/11/04	Iodine-129	0.0736	0.029	UJ
MW-17-2	05/17/05	Iodine-129	-0.0162	0.165	U
MW-2	02/01/05	Iodine-129	0.0968	0.0238	
MW-2	02/01/05	Iodine-129	0.111	0.0367	J
MW-2	02/01/05	Iodine-129	0.0972	0.0418	J
MW-20-2	02/09/05	Iodine-129	0.00881	0.0214	U
MW-5-2	02/02/05	Iodine-129	0.77	0.103	
MW-5-2	02/02/05	Iodine-129	0.553	0.073	
MW-6	02/09/05	Iodine-129	0.021	0.0379	UJ
MW-9-2	05/18/05	Iodine-129	0.0292	0.0204	U
TF-CH	02/08/05	Iodine-129	-0.0589	0.0324	UJ
ICPP-2019	04/19/05	Iodine-129	0.0533	0.022	UJ
ICPP-2018	04/19/05	Iodine-129	1.33	0.11	
USGS-050	02/16/05	Iodine-129	0.839	0.0806	
33-1	05/11/05	Manganese-54	0.0193	2.17	U
33-2	02/15/05	Manganese-54	0.555	1.21	U
33-4-1	02/21/05	Manganese-54	-2.86	2.62	U
37-4	02/21/05	Manganese-54	-2.81	2.7	U
55-06	02/01/05	Manganese-54	-2.71	1.49	U
BLR-DP	03/02/05	Manganese-54	-0.113	0.942	U
CS-CH	02/22/05	Manganese-54	8.71	3.1	UJ
MW-1-4	05/18/05	Manganese-54	0.0402	1.82	U
MW-15	10/11/04	Manganese-54	0.557	2.19	U
MW-15	10/11/04	Manganese-54	-2.03	2.27	U
MW-17-2	05/17/05	Manganese-54	1.65	2.53	U
MW-2	02/01/05	Manganese-54	1.25	1.77	U
MW-2	02/01/05	Manganese-54	-2.79	2.52	U
MW-20-2	02/09/05	Manganese-54	-0.499	1.57	U
MW-5-2	02/01/05	Manganese-54	2.8	1.78	U
MW-5-2	02/01/05	Manganese-54	3.22	1.69	U
MW-6	02/09/05	Manganese-54	1.08	1.45	U
MW-9-2	05/17/05	Manganese-54	-2.18	2.25	U
TF-CH	02/08/05	Manganese-54	2.31	1.51	U
ICPP-2019	04/19/05	Manganese-54	2.1	1.82	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
ICPP-2018	04/19/05	Manganese-54	-0.372	1.45	U
USGS-050	02/16/05	Manganese-54	0.174	1.13	U
33-1	05/11/05	Neptunium-237	0.739	1.5	U
33-2	02/15/05	Neptunium-237	-0.0388	0.0256	U
33-4-1	02/21/05	Neptunium-237	-0.00626	0.00626	U
37-4	02/21/05	Neptunium-237	-0.0269	0.0135	U
55-06	02/01/05	Neptunium-237	-0.000437	0.031	U
BLR-DP	03/02/05	Neptunium-237	-0.0398	0.0317	U
CS-CH	02/22/05	Neptunium-237	-0.0208	0.0121	U
MW-1-4	05/18/05	Neptunium-237	-0.0285	0.0202	U
MW-15	10/11/04	Neptunium-237	-0.0354	0.0135	U
MW-15	10/11/04	Neptunium-237	0.00596	0.0231	U
MW-17-2	05/17/05	Neptunium-237	0.0434	0.0481	U
MW-2	02/01/05	Neptunium-237	-0.000626	0.0384	U
MW-2	02/01/05	Neptunium-237	0.0656	0.0381	U
MW-20-2	02/09/05	Neptunium-237	-0.0321	0.0317	U
MW-5-2	02/01/05	Neptunium-237	-0.0458	0.0283	U
MW-5-2	02/01/05	Neptunium-237	-0.000322	0.028	U
MW-6	02/09/05	Neptunium-237	0.0138	0.0283	U
MW-9-2	05/17/05	Neptunium-237	3.4E-09	0.0404	U
TF-CH	02/08/05	Neptunium-237	-0.0365	0.0344	U
ICPP-2019	04/19/05	Neptunium-237	0.0669	0.0435	U
ICPP-2018	04/19/05	Neptunium-237	0.0231	0.0221	U
USGS-050	02/16/05	Neptunium-237	-0.018	0.0251	U
33-1	05/11/05	Plutonium-238	-0.432	2.34	U
33-2	02/15/05	Plutonium-238	-0.00743	0.0188	U
33-4-1	02/21/05	Plutonium-238	-0.0097	0.0465	U
37-4	02/21/05	Plutonium-238	0.0612	0.042	U
55-06	02/01/05	Plutonium-238	0.00614	0.0343	U
BLR-DP	03/02/05	Plutonium-238	-0.00207	0.0362	U
CS-CH	02/22/05	Plutonium-238	-0.0371	0.0479	U
MW-1-4	05/18/05	Plutonium-238	0.00635	0.0129	U
MW-15	10/11/04	Plutonium-238	-0.0191	0.0096	U
MW-15	10/11/04	Plutonium-238	0.019	0.0274	U
MW-17-2	05/17/05	Plutonium-238	0.0137	0.0157	U
MW-2	02/01/05	Plutonium-238	-0.0203	0.0297	U
MW-2	02/01/05	Plutonium-238	0.0427	0.035	U
MW-20-2	02/09/05	Plutonium-238	0.0281	0.0233	U
MW-5-2	02/01/05	Plutonium-238	0.0214	0.0273	U
MW-5-2	02/01/05	Plutonium-238	0.00094	0.0184	U
MW-6	02/09/05	Plutonium-238	-0.0112	0.0207	U
MW-9-2	05/17/05	Plutonium-238	-0.00644	0.0163	U
TF-CH	02/08/05	Plutonium-238	0.0146	0.0231	U
ICPP-2019	04/19/05	Plutonium-238	0.0758	0.0432	U
ICPP-2018	04/19/05	Plutonium-238	0.0232	0.0268	U
USGS-050	02/16/05	Plutonium-238	0.0334	0.0277	U
33-1	05/11/05	Plutonium-239/240	2.11	1.72	U
33-2	02/15/05	Plutonium-239/240	0.00325	0.0126	U
33-4-1	02/21/05	Plutonium-239/240	0.0679	0.0323	UJ
37-4	02/21/05	Plutonium-239/240	-0.0524	0.0327	U
55-06	02/01/05	Plutonium-239/240	-0.0101	0.0132	U
BLR-DP	03/02/05	Plutonium-239/240	-0.00912	0.0209	U
CS-CH	02/22/05	Plutonium-239/240	-0.0124	0.0276	U
MW-1-4	05/18/05	Plutonium-239/240	-0.00586	0.00415	U
MW-15	10/11/04	Plutonium-239/240	0.0103	0.021	U
MW-15	10/11/04	Plutonium-239/240	-0.00439	0.0044	U
MW-17-2	05/17/05	Plutonium-239/240	-0.00256	0.00256	U
MW-2	02/01/05	Plutonium-239/240	-0.0241	0.0218	U
MW-2	02/01/05	Plutonium-239/240	0.0181	0.0213	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
MW-20-2	02/09/05	Plutonium-239/240	-0.019	0.00679	U
MW-5-2	02/01/05	Plutonium-239/240	-0.0136	0.00614	U
MW-5-2	02/01/05	Plutonium-239/240	0.0207	0.0169	U
MW-6	02/09/05	Plutonium-239/240	0.00538	0.0109	U
MW-9-2	05/17/05	Plutonium-239/240	-0.00966	0.00486	U
TF-CH	02/08/05	Plutonium-239/240	-0.018	0.00688	U
ICPP-2019	04/19/05	Plutonium-239/240	0.0143	0.0193	U
ICPP-2018	04/19/05	Plutonium-239/240	0.0181	0.0182	U
USGS-050	02/16/05	Plutonium-239/240	0.0268	0.021	U
33-1	05/11/05	Plutonium-241	-208	197	U
33-2	02/15/05	Plutonium-241	-0.454	1.95	U
33-4-1	02/21/05	Plutonium-241	-4.38	2.15	U
37-4	02/21/05	Plutonium-241	-1.19	2.35	U
55-06	02/01/05	Plutonium-241	1.38	2.04	U
BLR-DP	03/02/05	Plutonium-241	1.55	2.19	U
CS-CH	02/22/05	Plutonium-241	25.3	13.9	U
MW-1-4	05/18/05	Plutonium-241	0.229	2.14	U
MW-17-2	05/17/05	Plutonium-241	4.46	2.13	UJ
MW-2	02/01/05	Plutonium-241	4.55	2.13	UJ
MW-2	02/01/05	Plutonium-241	0.895	2.13	U
MW-20-2	02/09/05	Plutonium-241	-1.68	1.87	U
MW-5-2	02/01/05	Plutonium-241	-0.698	2.08	U
MW-5-2	02/01/05	Plutonium-241	-1.27	2.01	U
MW-6	02/09/05	Plutonium-241	-0.547	2.08	U
MW-9-2	05/17/05	Plutonium-241	0	1.83	U
TF-CH	02/08/05	Plutonium-241	1.97	2.11	U
ICPP-2019	04/19/05	Plutonium-241	-1.49	2.06	U
ICPP-2018	04/19/05	Plutonium-241	0.622	2.39	U
USGS-050	02/16/05	Plutonium-241	0.35	2.01	U
33-1	05/11/05	Ruthenium-106	38.6	24.7	U
33-2	02/15/05	Ruthenium-106	1.53	11.9	U
33-4-1	02/21/05	Ruthenium-106	-19.7	22	U
37-4	02/21/05	Ruthenium-106	-34	23.9	U
55-06	02/01/05	Ruthenium-106	3.61	19.7	U
BLR-DP	03/02/05	Ruthenium-106	3.5	9.11	U
CS-CH	02/22/05	Ruthenium-106	26.3	24	U
MW-1-4	05/18/05	Ruthenium-106	-10.3	15.6	U
MW-15	10/11/04	Ruthenium-106	-8.75	25	U
MW-15	10/11/04	Ruthenium-106	41.9	21.1	U
MW-17-2	05/17/05	Ruthenium-106	41.1	28	U
MW-2	02/01/05	Ruthenium-106	19.6	20.4	U
MW-2	02/01/05	Ruthenium-106	4.89	29.5	U
MW-20-2	02/09/05	Ruthenium-106	17.6	12.7	U
MW-5-2	02/01/05	Ruthenium-106	3.06	15	U
MW-5-2	02/01/05	Ruthenium-106	-18.2	17.2	U
MW-6	02/09/05	Ruthenium-106	19.2	13.4	U
MW-9-2	05/17/05	Ruthenium-106	-1.89	24.1	U
TF-CH	02/08/05	Ruthenium-106	12.8	11.6	U
ICPP-2019	04/19/05	Ruthenium-106	12.8	18.2	U
ICPP-2018	04/19/05	Ruthenium-106	-13.1	14.1	U
USGS-050	02/16/05	Ruthenium-106	-12.7	12.3	U
33-1	05/11/05	Silver-108 meta-stable	4.6	3.34	U
33-2	02/15/05	Silver-108 meta-stable	-0.874	1.2	U
33-4-1	02/21/05	Silver-108 meta-stable	-1.24	2.72	U
37-4	02/21/05	Silver-108 meta-stable	-1.89	2.33	U
55-06	02/01/05	Silver-108 meta-stable	-2.41	2.06	U
BLR-DP	03/02/05	Silver-108 meta-stable	-1.09	1.04	U
CS-CH	02/22/05	Silver-108 meta-stable	-6.57	2.43	U
MW-1-4	05/18/05	Silver-108 meta-stable	-1.59	1.76	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
MW-15	10/11/04	Silver-108 meta-stable	-2.7	2.35	U
MW-15	10/11/04	Silver-108 meta-stable	0.373	2.47	U
MW-17-2	05/17/05	Silver-108 meta-stable	0.268	3.05	U
MW-2	02/01/05	Silver-108 meta-stable	1.51	2.76	U
MW-2	02/01/05	Silver-108 meta-stable	11	3.61	UJ
MW-20-2	02/09/05	Silver-108 meta-stable	-3.06	1.47	U
MW-5-2	02/01/05	Silver-108 meta-stable	1.86	1.81	U
MW-5-2	02/01/05	Silver-108 meta-stable	1.78	2.1	U
MW-6	02/09/05	Silver-108 meta-stable	1.32	1.65	U
MW-9-2	05/17/05	Silver-108 meta-stable	-0.1	2.41	U
TF-CH	02/08/05	Silver-108 meta-stable	-0.114	1.28	U
ICPP-2019	04/19/05	Silver-108 meta-stable	4.87	2.26	UJ
ICPP-2018	04/19/05	Silver-108 meta-stable	2.13	1.72	U
USGS-050	02/16/05	Silver-108 meta-stable	0.538	1.15	U
33-1	05/11/05	Silver-110 meta-stable	-0.233	2.98	U
33-2	02/15/05	Silver-110 meta-stable	-1.67	1.19	U
33-4-1	02/21/05	Silver-110 meta-stable	0.0439	2.39	U
37-4	02/21/05	Silver-110 meta-stable	-1.82	2.36	U
55-06	02/01/05	Silver-110 meta-stable	1.01	2.53	U
BLR-DP	03/02/05	Silver-110 meta-stable	0.892	0.912	U
CS-CH	02/22/05	Silver-110 meta-stable	5.75	2.61	UJ
MW-1-4	05/18/05	Silver-110 meta-stable	3.08	3.35	U
MW-15	10/11/04	Silver-110 meta-stable	-1.87	3	U
MW-15	10/11/04	Silver-110 meta-stable	1.85	2.48	U
MW-17-2	05/17/05	Silver-110 meta-stable	-0.792	2.66	U
MW-2	02/01/05	Silver-110 meta-stable	-1.74	2.26	U
MW-2	02/01/05	Silver-110 meta-stable	-0.145	2.74	U
MW-20-2	02/09/05	Silver-110 meta-stable	-0.221	1.37	U
MW-5-2	02/01/05	Silver-110 meta-stable	-0.377	1.56	U
MW-5-2	02/01/05	Silver-110 meta-stable	-0.881	1.84	U
MW-6	02/09/05	Silver-110 meta-stable	-2.83	1.51	U
MW-9-2	05/17/05	Silver-110 meta-stable	1.44	2.95	U
TF-CH	02/08/05	Silver-110 meta-stable	-0.179	1.28	U
ICPP-2019	04/19/05	Silver-110 meta-stable	-1.33	1.81	U
ICPP-2018	04/19/05	Silver-110 meta-stable	0.156	1.73	U
USGS-050	02/16/05	Silver-110 meta-stable	1.06	1.03	U
33-1	05/11/05	Strontium-90	159000	2290	
33-2	02/15/05	Strontium-90	151	3.54	
33-3	02/09/05	Strontium-90	11.4	2.38	
33-4-1	02/21/05	Strontium-90	40.1	1.11	
37-4	02/21/05	Strontium-90	30.9	0.95	
55-06	02/01/05	Strontium-90	25900	515	
BLR-CH	05/18/05	Strontium-90	2.06	0.223	
BLR-DP	03/02/05	Strontium-90	0.918	0.203	
CS-CH	02/22/05	Strontium-90	0.443	0.161	
MW-10-2	05/10/05	Strontium-90	13100	200	
MW-1-4	05/18/05	Strontium-90	2.26	0.229	
MW-15	10/11/04	Strontium-90	5330	1100	J
MW-15	10/11/04	Strontium-90	4620	801	J
MW-17-2	05/17/05	Strontium-90	2.2	0.258	
MW-2	02/01/05	Strontium-90	188000	3700	
MW-2	02/01/05	Strontium-90	192000	3640	
MW-20-2	02/09/05	Strontium-90	19500	430	
MW-5-2	02/01/05	Strontium-90	61200	1190	
MW-5-2	02/01/05	Strontium-90	62500	1230	
MW-6	02/09/05	Strontium-90	1.04	0.179	
MW-7-2	02/09/05	Strontium-90	3.09	0.312	
MW-7-2	05/11/05	Strontium-90	13.9	0.54	
MW-9-2	05/18/05	Strontium-90	2400	27	

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
TF-CH	02/08/05	Strontium-90	4.74	0.287	
ICPP-2019	04/19/05	Strontium-90	36500	1190	
ICPP-2018	04/19/05	Strontium-90	127000	3220	
USGS-050	02/16/05	Strontium-90	120	5.67	
33-1	05/11/05	Technetium-99	178	5.2	
33-2	02/15/05	Technetium-99	4.62	2.47	U
33-3	02/09/05	Technetium-99	12.4	2.45	J
33-4-1	02/21/05	Technetium-99	9.77	1.49	
37-4	02/21/05	Technetium-99	4.25	1.36	
55-06	02/01/05	Technetium-99	23.9	2.47	J
BLR-CH	05/18/05	Technetium-99	1.74	1.65	U
BLR-DP	03/02/05	Technetium-99	12.2	1.28	J
CS-CH	02/22/05	Technetium-99	7.11	2.02	UJ
MW-10-2	05/10/05	Technetium-99	349	7.22	
MW-1-4	05/18/05	Technetium-99	4.88	1.38	UJ
MW-15	10/11/04	Technetium-99	18.1	0.691	
MW-15	10/11/04	Technetium-99	18	0.7	
MW-17-2	05/17/05	Technetium-99	3.3	1.6	UJ
MW-2	02/01/05	Technetium-99	35.7	2.65	J
MW-2	02/01/05	Technetium-99	36.3	2.64	J
MW-20-2	02/09/05	Technetium-99	12.8	2.36	J
MW-5-2	02/01/05	Technetium-99	28.4	2.42	J
MW-5-2	02/01/05	Technetium-99	43.8	2.93	J
MW-6	02/09/05	Technetium-99	4.89	1.96	UJ
MW-7-2	02/09/05	Technetium-99	7.3	2.01	J
MW-7-2	05/11/05	Technetium-99	6.35	1.49	
MW-9-2	05/18/05	Technetium-99	11.6	1.55	
TF-CH	02/08/05	Technetium-99	8.29	2.07	J
ICPP-2019	04/19/05	Technetium-99	10.1	0.484	J
ICPP-2018	04/19/05	Technetium-99	38.8	0.79	
USGS-050	02/16/05	Technetium-99	31.1	3.02	J
33-1	05/11/05	Tritium	5100	1110	
33-2	02/15/05	Tritium	1730	124	
33-3	02/09/05	Tritium	388	108	
33-4-1	02/21/05	Tritium	184	114	U
37-4	02/21/05	Tritium	760	128	
55-06	02/02/05	Tritium	182	107	U
BLR-CH	02/08/05	Tritium	59.4	104	U
BLR-CH	05/18/05	Tritium	71.6	101	U
BLR-DP	03/02/05	Tritium	2060	168	
CS-CH	02/22/05	Tritium	425	121	
MW-1-4	05/18/05	Tritium	7320	320	
MW-15	10/11/04	Tritium	291	97.4	UJ
MW-15	10/11/04	Tritium	392	99	
MW-17-2	05/17/05	Tritium	21000	544	
MW-2	02/01/05	Tritium	861	117	
MW-2	02/01/05	Tritium	885	117	
MW-20-2	02/09/05	Tritium	223	106	UJ
MW-5-2	02/01/05	Tritium	3500	152	
MW-5-2	02/01/05	Tritium	3660	155	
MW-6	02/09/05	Tritium	155	106	U
MW-7-2	02/09/05	Tritium	30800	428	
MW-9-2	05/17/05	Tritium	361	118	
TF-CH	02/08/05	Tritium	138	105	U
ICPP-2019	04/19/05	Tritium	391	101	UJ
ICPP-2018	04/19/05	Tritium	9070	214	
USGS-050	02/16/05	Tritium	19800	325	
33-1	05/11/05	Uranium-233/234	9.07	3.92	UJ
33-2	02/15/05	Uranium-233/234	1.45	0.17	

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
33-4-1	02/21/05	Uranium-233/234	1.89	0.287	
37-4	02/21/05	Uranium-233/234	3.91	0.431	
55-06	02/01/05	Uranium-233/234	2.57	0.226	
BLR-DP	03/02/05	Uranium-233/234	3.84	0.286	
CS-CH	02/22/05	Uranium-233/234	9.88	0.872	
MW-1-4	05/18/05	Uranium-233/234	2.16	0.206	
MW-15	10/11/04	Uranium-233/234	3.37	0.362	
MW-15	10/11/04	Uranium-233/234	2.87	0.348	
MW-17-2	05/17/05	Uranium-233/234	2.31	0.222	
MW-2	02/01/05	Uranium-233/234	1.97	0.187	
MW-2	02/01/05	Uranium-233/234	2.03	0.203	
MW-20-2	02/09/05	Uranium-233/234	2.99	0.295	
MW-5-2	02/01/05	Uranium-233/234	2.21	0.22	
MW-5-2	02/01/05	Uranium-233/234	2.55	0.252	
MW-6	02/09/05	Uranium-233/234	2.06	0.217	
MW-9-2	05/17/05	Uranium-233/234	2.59	0.239	
TF-CH	02/08/05	Uranium-233/234	2.34	0.245	
ICPP-2019	04/19/05	Uranium-233/234	2.27	0.263	
ICPP-2018	04/19/05	Uranium-233/234	2.23	0.234	
USGS-050	02/16/05	Uranium-233/234	3.83	0.361	
33-1	05/11/05	Uranium-235	3.65	2.57	U
33-2	02/15/05	Uranium-235	0.0402	0.0234	U
33-4-1	02/21/05	Uranium-235	0.0197	0.0401	U
37-4	02/21/05	Uranium-235	0.124	0.0808	U
55-06	02/01/05	Uranium-235	0.0808	0.0309	J
BLR-DP	03/02/05	Uranium-235	0.17	0.0474	
CS-CH	02/22/05	Uranium-235	0.239	0.0986	J
MW-1-4	05/18/05	Uranium-235	0.0979	0.0342	J
MW-15	10/11/04	Uranium-235	0.132	0.0629	UJ
MW-15	10/11/04	Uranium-235	0.169	0.0733	J
MW-17-2	05/17/05	Uranium-235	0.146	0.0434	
MW-2	02/01/05	Uranium-235	0.0921	0.033	J
MW-2	02/01/05	Uranium-235	0.104	0.04	J
MW-20-2	02/09/05	Uranium-235	0.109	0.042	J
MW-5-2	02/01/05	Uranium-235	0.021	0.0201	U
MW-5-2	02/01/05	Uranium-235	0.0376	0.0264	U
MW-6	02/09/05	Uranium-235	0.107	0.0413	J
MW-9-2	05/17/05	Uranium-235	0.131	0.0387	
TF-CH	02/08/05	Uranium-235	0.187	0.0556	
ICPP-2019	04/19/05	Uranium-235	0.172	0.0676	UJ
ICPP-2018	04/19/05	Uranium-235	0.1	0.0414	J
USGS-050	02/16/05	Uranium-235	0.0818	0.0371	UJ
33-1	05/11/05	Uranium-238	3.99	2.54	U
33-2	02/15/05	Uranium-238	0.868	0.121	
33-4-1	02/21/05	Uranium-238	0.956	0.195	
37-4	02/21/05	Uranium-238	1.92	0.279	
55-06	02/01/05	Uranium-238	1.24	0.137	
BLR-DP	03/02/05	Uranium-238	1.73	0.166	
CS-CH	02/22/05	Uranium-238	8.46	0.777	
MW-1-4	05/18/05	Uranium-238	1.37	0.149	
MW-15	10/11/04	Uranium-238	0.89	0.157	
MW-15	10/11/04	Uranium-238	1.19	0.202	
MW-17-2	05/17/05	Uranium-238	2.08	0.205	
MW-2	02/01/05	Uranium-238	1	0.12	
MW-2	02/01/05	Uranium-238	0.962	0.126	
MW-20-2	02/09/05	Uranium-238	1.51	0.181	
MW-5-2	02/01/05	Uranium-238	1.14	0.142	
MW-5-2	02/01/05	Uranium-238	1.31	0.161	
MW-6	02/09/05	Uranium-238	1.18	0.147	

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
MW-9-2	05/17/05	Uranium-238	2.01	0.198	
TF-CH	02/08/05	Uranium-238	1.42	0.172	
ICPP-2019	04/19/05	Uranium-238	1.22	0.177	
ICPP-2018	04/19/05	Uranium-238	1.05	0.146	
USGS-050	02/16/05	Uranium-238	2.26	0.241	
33-1	05/11/05	Zinc-65	-5.62	3.88	U
33-2	02/15/05	Zinc-65	0.241	3	U
33-4-1	02/21/05	Zinc-65	-2	6.28	U
37-4	02/21/05	Zinc-65	-13.9	7.1	U
55-06	02/01/05	Zinc-65	-8.6	5.17	U
BLR-DP	03/02/05	Zinc-65	0.273	2.25	U
CS-CH	02/22/05	Zinc-65	-18.6	6.17	U
MW-1-4	05/18/05	Zinc-65	-7.08	4.66	U
MW-15	10/11/04	Zinc-65	-3.74	4.73	U
MW-15	10/11/04	Zinc-65	-1.18	4.45	U
MW-17-2	05/17/05	Zinc-65	-4.94	5.76	U
MW-2	02/01/05	Zinc-65	0.032	4	U
MW-2	02/01/05	Zinc-65	-1.04	4.27	U
MW-20-2	02/09/05	Zinc-65	3.32	2.29	U
MW-5-2	02/01/05	Zinc-65	-2.79	2.89	U
MW-5-2	02/01/05	Zinc-65	-1.25	3.81	U
MW-6	02/09/05	Zinc-65	-3.29	3.75	U
MW-9-2	05/17/05	Zinc-65	6.31	5.81	U
TF-CH	02/08/05	Zinc-65	-4.63	3.49	U
ICPP-2019	04/19/05	Zinc-65	0.843	4.24	U
ICPP-2018	04/19/05	Zinc-65	-0.651	3.46	U
USGS-050	02/16/05	Zinc-65	4.15	2.22	U
Suction Lysimeters					
A-60-39	05/23/05	Strontium-90	-0.0582	0.304	U
A-62-41	05/23/05	Strontium-90	0.341	0.261	U
A-63-45	03/01/05	Strontium-90	-0.222	0.203	U
A-64-40	05/23/05	Strontium-90	0.653	0.267	UJ
A-65-36	03/01/05	Strontium-90	0.0663	0.201	U
BLR-AL-L32	05/23/05	Strontium-90	0.329	0.166	U
BLR-DP-L352	03/01/05	Strontium-90	0.111	0.178	U
BLR-SP-L167	03/01/05	Strontium-90	-0.223	0.175	U
CS-AL-L41	05/23/05	Strontium-90	-0.0879	0.172	U
CS-DP-L280	03/01/05	Strontium-90	0.135	0.142	U
CS-SP-L122	03/01/05	Strontium-90	17	0.706	
CS-SP-L155	05/23/05	Strontium-90	14.7	0.535	
PP-AL-L27	05/23/05	Strontium-90	2.2	0.232	
PP-DP-L383	05/23/05	Strontium-90	0.225	0.165	U
PP-SP-L108	05/23/05	Strontium-90	0.391	0.413	U
STL-AL-L26	05/23/05	Strontium-90	0.0625	0.17	U
STL-DP-L418	03/01/05	Strontium-90	-0.221	0.171	U
STL-SP-L103	05/23/05	Strontium-90	0.17	0.182	U
TF-AL-L35	03/01/05	Strontium-90	0.547	0.183	UJ
TF-DP-L385	05/23/05	Strontium-90	-0.00653	0.126	U
TF-SP-L118	05/23/05	Strontium-90	0.229	0.165	U
A-60-39	05/23/05	Technetium-99	-3.55	1.76	U
A-63-45	03/01/05	Technetium-99	16.7	2.75	J
A-64-40	05/23/05	Technetium-99	-4.45	2.04	U
A-65-36	03/01/05	Technetium-99	5.14	1.22	UJ
BLR-AL-L32	05/23/05	Technetium-99	1.66	1.46	U
BLR-DP-L352	03/01/05	Technetium-99	7.37	1.13	J
BLR-SP-L167	03/01/05	Technetium-99	2.64	1.09	UJ
CS-AL-L41	05/23/05	Technetium-99	1.98	1.54	U
CS-DP-L280	03/01/05	Technetium-99	22.2	3.05	J
CS-SP-L122	05/23/05	Technetium-99	-5.44	2.21	U

Table B-3. (continued).

Location	Date Collected	Constituent	Concentration	Combined Standard Uncertainty	Data Qualifier Flags
CS-SP-L155	05/23/05	Technetium-99	0.148	1.41	U
PP-AL-L27	05/23/05	Technetium-99	4.97	1.73	UJ
PP-DP-L383	05/23/05	Technetium-99	3.35	1.73	U
STL-AL-L26	05/23/05	Technetium-99	2.3	1.61	U
STL-DP-L418	03/01/05	Technetium-99	8.97	1.27	J
TF-AL-L35	03/01/05	Technetium-99	5.67	1.14	UJ
TF-DP-L385	05/23/05	Technetium-99	1.56	1.22	U
A-63-45	03/01/05	Tritium	508	124	
A-65-36	05/23/05	Tritium	473	124	
BLR-AL-L32	03/01/05	Tritium	105	113	U
BLR-DP-L352	03/01/05	Tritium	159	114	U
BLR-SP-L167	05/23/05	Tritium	285	113	UJ
CS-DP-L280	03/01/05	Tritium	1800	153	
CS-SP-L122	03/01/05	Tritium	219	120	U
CS-SP-L155	05/23/05	Tritium	395	119	
PP-AL-L27	05/23/05	Tritium	464	122	
PP-SP-L169	03/01/05	Tritium	663	127	
STL-AL-L26	05/23/05	Tritium	217	110	U
STL-DP-L418	03/01/05	Tritium	158	114	U
STL-SP-L103	03/01/05	Tritium	239	117	UJ
TF-AL-L35	05/23/05	Tritium	323	116	UJ
TF-DP-L385	05/23/05	Tritium	838	141	
TF-SP-L118	03/01/05	Tritium	344	119	UJ

Data Qualifier Flags:
B = IDLH ≤ value < CRDL
E = serial dilutions outside limits
H = holding time exceeded
J = estimated value
R = rejected value
U = not detected
UJ = not detected, quantitation limit is an estimate.

Table B-4. 2004 concentrations of inorganic constituents in perched water.

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
Perched Water Monitoring Wells					
33-1	05/11/05	Alkalinity(Total)	184	MG/L	
33-2	02/15/05	Alkalinity(Total)	131	MG/L	
33-3	02/09/05	Alkalinity(Total)	73.2	MG/L	
33-4-1	02/21/05	Alkalinity(Total)	163	MG/L	
37-4	02/21/05	Alkalinity(Total)	213	MG/L	
55-06	02/01/05	Alkalinity(Total)	190	MG/L	J, H
BLR-CH	02/08/05	Alkalinity(Total)	188	MG/L	
BLR-DP	03/02/05	Alkalinity(Total)	190	MG/L	
CS-CH	02/22/05	Alkalinity(Total)	152	MG/L	
MW-10-2	02/02/05	Alkalinity(Total)	220	MG/L	
MW-1-4	05/18/05	Alkalinity(Total)	138	MG/L	
MW-15	10/11/04	Alkalinity(Total)	147	MG/L	
MW-15	10/11/04	Alkalinity(Total)	150	MG/L	
MW-17-2	05/17/05	Alkalinity(Total)	154	MG/L	
MW-2	02/01/05	Alkalinity(Total)	202	MG/L	J, H
MW-2	02/01/05	Alkalinity(Total)	199	MG/L	J, H
MW-20-2	02/09/05	Alkalinity(Total)	188	MG/L	
MW-5-2	02/01/05	Alkalinity(Total)	335	MG/L	J, H
MW-5-2	02/01/05	Alkalinity(Total)	340	MG/L	J, H
MW-6	02/09/05	Alkalinity(Total)	167	MG/L	
MW-7-2	02/09/05	Alkalinity(Total)	162	MG/L	
MW-9-2	05/18/05	Alkalinity(Total)	140	MG/L	
TF-CH	02/08/05	Alkalinity(Total)	193	MG/L	
ICPP-2019	04/19/05	Alkalinity(Total)	198	MG/L	
ICPP-2018	04/19/05	Alkalinity(Total)	355	MG/L	
USGS-050	02/16/05	Alkalinity(Total)	38.7	MG/L	
33-1	05/11/05	Aluminum	5690	UG/L	
33-1	05/11/05	Aluminum	5	UG/L	U
33-2	02/15/05	Aluminum	9.08	UG/L	U
33-2	02/15/05	Aluminum	1290	UG/L	
33-3	02/09/05	Aluminum	61100	UG/L	R, E, N
33-3	02/09/05	Aluminum	9.08	UG/L	U
33-4-1	02/21/05	Aluminum	9.08	UG/L	U
33-4-1	02/21/05	Aluminum	24.3	UG/L	B
37-4	02/21/05	Aluminum	35.7	UG/L	B
37-4	02/21/05	Aluminum	309	UG/L	
55-06	02/01/05	Aluminum	9.08	UG/L	J, E, N
55-06	02/01/05	Aluminum	3640	UG/L	J, E, N
BLR-CH	02/08/05	Aluminum	9.5	UG/L	B
BLR-DP	03/02/05	Aluminum	6810	UG/L	
BLR-DP	03/02/05	Aluminum	15.1	UG/L	B
CS-CH	02/22/05	Aluminum	9.08	UG/L	U
CS-CH	02/22/05	Aluminum	72900	UG/L	
MW-10-2	02/02/05	Aluminum	12900	UG/L	J, E, N
MW-10-2	02/03/05	Aluminum	9.08	UG/L	U
MW-1-4	05/18/05	Aluminum	28.9	UG/L	B
MW-1-4	05/18/05	Aluminum	3250	UG/L	
MW-15	10/11/04	Aluminum	14.7	UG/L	UJ
MW-15	10/11/04	Aluminum	25.2	UG/L	J, B
MW-17-2	05/17/05	Aluminum	18600	UG/L	
MW-17-2	05/17/05	Aluminum	13.7	UG/L	U, B
MW-2	02/01/05	Aluminum	11.2	UG/L	J, B, E, N

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-2	02/01/05	Aluminum	15.6	UG/L	J, B, E, N
MW-2	02/01/05	Aluminum	9.5	UG/L	J, B, E, N
MW-2	02/01/05	Aluminum	13.6	UG/L	J, B, E, N
MW-20-2	02/09/05	Aluminum	5700	UG/L	R, E, N
MW-20-2	02/09/05	Aluminum	9.9	UG/L	B
MW-5-2	02/01/05	Aluminum	9.08	UG/L	J, U, E, N
MW-5-2	02/01/05	Aluminum	9.08	UG/L	J, U, E, N
MW-5-2	02/01/05	Aluminum	9.08	UG/L	J, U, E, N
MW-5-2	02/01/05	Aluminum	9.08	UG/L	J, U, E, N
MW-6	02/09/05	Aluminum	9.08	UG/L	
MW-6	02/09/05	Aluminum	114	UG/L	R, B, E, N
MW-7-2	02/09/05	Aluminum	9590	UG/L	R, E, N
MW-7-2	02/09/05	Aluminum	9.08	UG/L	U
MW-9-2	05/18/05	Aluminum	5.8	UG/L	U, B
MW-9-2	05/18/05	Aluminum	287	UG/L	
TF-CH	02/08/05	Aluminum	245	UG/L	R, E, N
TF-CH	02/08/05	Aluminum	9.08	UG/L	U
ICPP-2019	04/19/05	Aluminum	68	UG/L	U
ICPP-2019	04/19/05	Aluminum	171	UG/L	B
ICPP-2018	04/19/05	Aluminum	68	UG/L	U
ICPP-2018	04/19/05	Aluminum	68	UG/L	U
ICPP-2018	05/09/05	Aluminum	50	UG/L	U
ICPP-2018	05/09/05	Aluminum	50	UG/L	U
USGS-050	02/16/05	Aluminum	9.08	UG/L	U
USGS-050	02/16/05	Aluminum	2090	UG/L	
33-1	05/11/05	Antimony	0.57	UG/L	B
33-1	05/11/05	Antimony	0.5	UG/L	U
33-2	02/15/05	Antimony	0.43	UG/L	U, B
33-2	02/15/05	Antimony	1.3	UG/L	U
33-3	02/09/05	Antimony	3.2	UG/L	B
33-3	02/09/05	Antimony	0.54	UG/L	U, B
33-4-1	02/21/05	Antimony	0.28	UG/L	U, B
33-4-1	02/21/05	Antimony	0.28	UG/L	U, B
37-4	02/21/05	Antimony	0.28	UG/L	U, B
37-4	02/21/05	Antimony	0.3	UG/L	B
55-06	02/01/05	Antimony	1.9	UG/L	U, B
55-06	02/01/05	Antimony	0.28	UG/L	U
BLR-CH	02/08/05	Antimony	0.87	UG/L	U, B
BLR-DP	03/02/05	Antimony	29	UG/L	
BLR-DP	03/02/05	Antimony	31.8	UG/L	
CS-CH	02/22/05	Antimony	1.3	UG/L	B
CS-CH	02/22/05	Antimony	4.8	UG/L	B
MW-10-2	02/02/05	Antimony	0.53	UG/L	U, B
MW-10-2	02/03/05	Antimony	0.57	UG/L	U, B
MW-1-4	05/18/05	Antimony	0.5	UG/L	U
MW-1-4	05/18/05	Antimony	0.5	UG/L	U
MW-15	10/11/04	Antimony	5.08	UG/L	UJ
MW-15	10/11/04	Antimony	5.08	UG/L	UJ
MW-17-2	05/17/05	Antimony	1.9	UG/L	B
MW-17-2	05/17/05	Antimony	0.93	UG/L	B
MW-2	02/01/05	Antimony	0.28	UG/L	U
MW-2	02/01/05	Antimony	0.28	UG/L	U
MW-2	02/01/05	Antimony	0.28	UG/L	U
MW-2	02/01/05	Antimony	0.28	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-20-2	02/09/05	Antimony	0.37	UG/L	U
MW-20-2	02/09/05	Antimony	0.4	UG/L	U
MW-5-2	02/01/05	Antimony	0.28	UG/L	U
MW-5-2	02/01/05	Antimony	0.28	UG/L	U
MW-5-2	02/01/05	Antimony	0.33	UG/L	U, B
MW-5-2	02/01/05	Antimony	0.28	UG/L	U
MW-6	02/09/05	Antimony	0.34	UG/L	U, B
MW-6	02/09/05	Antimony	0.37	UG/L	U, B
MW-7-2	02/09/05	Antimony	3	UG/L	B
MW-7-2	02/09/05	Antimony	2.3	UG/L	U, B
MW-9-2	05/18/05	Antimony	0.5	UG/L	U
MW-9-2	05/18/05	Antimony	0.52	UG/L	B
TF-CH	02/08/05	Antimony	0.28	UG/L	U
TF-CH	02/08/05	Antimony	0.28	UG/L	U
ICPP-2019	04/19/05	Antimony	4	UG/L	U
ICPP-2019	04/19/05	Antimony	5.4	UG/L	U
ICPP-2018	04/19/05	Antimony	4	UG/L	U
ICPP-2018	04/19/05	Antimony	4	UG/L	U
ICPP-2018	05/09/05	Antimony	10	UG/L	U
ICPP-2018	05/09/05	Antimony	10	UG/L	U
USGS-050	02/16/05	Antimony	0.28	UG/L	U
USGS-050	02/16/05	Antimony	0.91	UG/L	U
33-1	05/11/05	Arsenic	3.4	UG/L	B
33-1	05/11/05	Arsenic	2	UG/L	B
33-2	02/15/05	Arsenic	5.7	UG/L	B, U
33-2	02/15/05	Arsenic	13.5	UG/L	B, U
33-3	02/09/05	Arsenic	23.9	UG/L	B
33-3	02/09/05	Arsenic	5.4	UG/L	U, B
33-4-1	02/21/05	Arsenic	7.2	UG/L	U, B
33-4-1	02/21/05	Arsenic	6.6	UG/L	U, B
37-4	02/21/05	Arsenic	8.9	UG/L	U, B
37-4	02/21/05	Arsenic	8	UG/L	U, B
55-06	02/01/05	Arsenic	1	UG/L	U
55-06	02/01/05	Arsenic	1	UG/L	U
BLR-CH	02/08/05	Arsenic	6.7	UG/L	U, B
BLR-DP	03/02/05	Arsenic	10.5	UG/L	U, B
BLR-DP	03/02/05	Arsenic	9	UG/L	U, B
CS-CH	02/22/05	Arsenic	5	UG/L	U, B
CS-CH	02/22/05	Arsenic	24.2	UG/L	U, B
MW-10-2	02/02/05	Arsenic	2.4	UG/L	B
MW-10-2	02/03/05	Arsenic	5.1	UG/L	U, B
MW-1-4	05/18/05	Arsenic	1.5	UG/L	U
MW-1-4	05/18/05	Arsenic	1.5	UG/L	U
MW-15	10/11/04	Arsenic	2.24	UG/L	UJ
MW-15	10/11/04	Arsenic	2.4	UG/L	J, B
MW-17-2	05/17/05	Arsenic	7.5	UG/L	B
MW-17-2	05/17/05	Arsenic	2.8	UG/L	B
MW-2	02/01/05	Arsenic	1	UG/L	U
MW-2	02/01/05	Arsenic	1	UG/L	U
MW-2	02/01/05	Arsenic	1	UG/L	U
MW-2	02/01/05	Arsenic	1	UG/L	U
MW-20-2	02/09/05	Arsenic	2.2	UG/L	B
MW-20-2	02/09/05	Arsenic	6.2	UG/L	U
MW-5-2	02/01/05	Arsenic	1	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-5-2	02/01/05	Arsenic	1	UG/L	U
MW-5-2	02/01/05	Arsenic	1	UG/L	U
MW-5-2	02/01/05	Arsenic	1	UG/L	U
MW-6	02/09/05	Arsenic	4.8	UG/L	U, B
MW-6	02/09/05	Arsenic	1	UG/L	B
MW-7-2	02/09/05	Arsenic	2.1	UG/L	B
MW-7-2	02/09/05	Arsenic	7.5	UG/L	U, B
MW-9-2	05/18/05	Arsenic	2	UG/L	B
MW-9-2	05/18/05	Arsenic	1.6	UG/L	B
TF-CH	02/08/05	Arsenic	1	UG/L	U
TF-CH	02/08/05	Arsenic	5.4	UG/L	U
ICPP-2019	04/19/05	Arsenic	6	UG/L	U
ICPP-2019	04/19/05	Arsenic	6	UG/L	U
ICPP-2019	05/03/05	Arsenic	5	UG/L	U
ICPP-2018	04/19/05	Arsenic	6	UG/L	U
ICPP-2018	04/19/05	Arsenic	6.2	UG/L	B
ICPP-2018	05/03/05	Arsenic	5	UG/L	U
ICPP-2018	05/09/05	Arsenic	5	UG/L	U
ICPP-2018	05/09/05	Arsenic	10	UG/L	U
ICPP-2018	05/09/05	Arsenic	10	UG/L	U
USGS-050	02/16/05	Arsenic	4.9	UG/L	U, B
USGS-050	02/16/05	Arsenic	6.3	UG/L	U, B
33-1	05/11/05	Barium	247	UG/L	
33-1	05/11/05	Barium	131	UG/L	
33-2	02/15/05	Barium	133	UG/L	
33-2	02/15/05	Barium	189	UG/L	
33-3	02/09/05	Barium	1220	UG/L	
33-3	02/09/05	Barium	122	UG/L	
33-4-1	02/21/05	Barium	146	UG/L	
33-4-1	02/21/05	Barium	141	UG/L	
37-4	02/21/05	Barium	243	UG/L	
37-4	02/21/05	Barium	261	UG/L	
55-06	02/01/05	Barium	166	UG/L	
55-06	02/01/05	Barium	196	UG/L	
BLR-CH	02/08/05	Barium	77.8	UG/L	B
BLR-DP	03/02/05	Barium	300	UG/L	
BLR-DP	03/02/05	Barium	192	UG/L	
CS-CH	02/22/05	Barium	100	UG/L	
CS-CH	02/22/05	Barium	870	UG/L	
MW-10-2	02/02/05	Barium	337	UG/L	
MW-10-2	02/03/05	Barium	232	UG/L	
MW-1-4	05/18/05	Barium	230	UG/L	
MW-1-4	05/18/05	Barium	267	UG/L	
MW-15	10/11/04	Barium	108	UG/L	J
MW-15	10/11/04	Barium	112	UG/L	J
MW-17-2	05/17/05	Barium	294	UG/L	
MW-17-2	05/17/05	Barium	10.2	UG/L	B
MW-2	02/01/05	Barium	218	UG/L	
MW-2	02/01/05	Barium	225	UG/L	
MW-2	02/01/05	Barium	225	UG/L	
MW-2	02/01/05	Barium	227	UG/L	
MW-20-2	02/09/05	Barium	228	UG/L	
MW-20-2	02/09/05	Barium	174	UG/L	
MW-5-2	02/01/05	Barium	353	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-5-2	02/01/05	Barium	342	UG/L	
MW-5-2	02/01/05	Barium	333	UG/L	
MW-5-2	02/01/05	Barium	354	UG/L	
MW-6	02/09/05	Barium	286	UG/L	
MW-6	02/09/05	Barium	273	UG/L	
MW-7-2	02/09/05	Barium	174	UG/L	
MW-7-2	02/09/05	Barium	53.9	UG/L	B
MW-9-2	05/18/05	Barium	76	UG/L	B
MW-9-2	05/18/05	Barium	81	UG/L	B
TF-CH	02/08/05	Barium	193	UG/L	
TF-CH	02/08/05	Barium	194	UG/L	
ICPP-2019	04/19/05	Barium	199	UG/L	
ICPP-2019	04/19/05	Barium	208	UG/L	
ICPP-2019	05/03/05	Barium	160	UG/L	
ICPP-2018	04/19/05	Barium	339	UG/L	
ICPP-2018	04/19/05	Barium	346	UG/L	
ICPP-2018	05/03/05	Barium	312	UG/L	
ICPP-2018	05/09/05	Barium	334	UG/L	
ICPP-2018	05/09/05	Barium	352	UG/L	
ICPP-2018	05/09/05	Barium	350	UG/L	
USGS-050	02/16/05	Barium	162	UG/L	
USGS-050	02/16/05	Barium	200	UG/L	
33-1	05/11/05	Beryllium	0.2	UG/L	B
33-1	05/11/05	Beryllium	0.1	UG/L	U
33-2	02/15/05	Beryllium	0.08	UG/L	U
33-2	02/15/05	Beryllium	0.08	UG/L	B
33-3	02/09/05	Beryllium	2.8	UG/L	
33-3	02/09/05	Beryllium	0.08	UG/L	U
33-4-1	02/21/05	Beryllium	0.08	UG/L	U
33-4-1	02/21/05	Beryllium	0.08	UG/L	U
37-4	02/21/05	Beryllium	0.08	UG/L	U
37-4	02/21/05	Beryllium	0.08	UG/L	U
55-06	02/01/05	Beryllium	0.08	UG/L	U
55-06	02/01/05	Beryllium	0.08	UG/L	U
BLR-CH	02/08/05	Beryllium	0.08	UG/L	U
BLR-DP	03/02/05	Beryllium	0.39	UG/L	B
BLR-DP	03/02/05	Beryllium	0.08	UG/L	U
CS-CH	02/22/05	Beryllium	0.08	UG/L	U
CS-CH	02/22/05	Beryllium	2	UG/L	
MW-10-2	02/02/05	Beryllium	0.25	UG/L	B
MW-10-2	02/03/05	Beryllium	0.08	UG/L	U
MW-1-4	05/18/05	Beryllium	0.1	UG/L	U
MW-1-4	05/18/05	Beryllium	0.16	UG/L	B
MW-15	10/11/04	Beryllium	0.08	UG/L	UJ
MW-15	10/11/04	Beryllium	0.08	UG/L	UJ
MW-17-2	05/17/05	Beryllium	1.3	UG/L	
MW-17-2	05/17/05	Beryllium	0.1	UG/L	U
MW-2	02/01/05	Beryllium	0.08	UG/L	U
MW-2	02/01/05	Beryllium	0.08	UG/L	U
MW-2	02/01/05	Beryllium	0.08	UG/L	U
MW-2	02/01/05	Beryllium	0.08	UG/L	U
MW-20-2	02/09/05	Beryllium	0.24	UG/L	B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-20-2	02/09/05	Beryllium	0.08	UG/L	U
MW-5-2	02/01/05	Beryllium	0.08	UG/L	U
MW-5-2	02/01/05	Beryllium	0.08	UG/L	U
MW-5-2	02/01/05	Beryllium	0.08	UG/L	U
MW-5-2	02/01/05	Beryllium	0.08	UG/L	U
MW-6	02/09/05	Beryllium	0.08	UG/L	U
MW-6	02/09/05	Beryllium	0.08	UG/L	U
MW-7-2	02/09/05	Beryllium	0.58	UG/L	B
MW-7-2	02/09/05	Beryllium	0.08	UG/L	U
MW-9-2	05/18/05	Beryllium	0.1	UG/L	U
MW-9-2	05/18/05	Beryllium	0.1	UG/L	U
TF-CH	02/08/05	Beryllium	0.083	UG/L	B
TF-CH	02/08/05	Beryllium	0.08	UG/L	U
ICPP-2019	04/19/05	Beryllium	1	UG/L	U
ICPP-2019	04/19/05	Beryllium	1	UG/L	U
ICPP-2018	04/19/05	Beryllium	1	UG/L	U
ICPP-2018	04/19/05	Beryllium	1	UG/L	U
ICPP-2018	05/09/05	Beryllium	0.8	UG/L	U
ICPP-2018	05/09/05	Beryllium	0.8	UG/L	U
USGS-050	02/16/05	Beryllium	0.08	UG/L	U
USGS-050	02/16/05	Beryllium	0.097	UG/L	B
33-1	05/11/05	Boron	133	UG/L	
33-1	05/11/05	Boron	131	UG/L	
33-2	02/15/05	Boron	36.8	UG/L	
33-2	02/15/05	Boron	38.9	UG/L	
33-3	02/09/05	Boron	35	UG/L	
33-3	02/09/05	Boron	36.9	UG/L	
33-4-1	02/21/05	Boron	32.2	UG/L	
33-4-1	02/21/05	Boron	32.4	UG/L	J, E
37-4	02/21/05	Boron	49.1	UG/L	
37-4	02/21/05	Boron	82.5	UG/L	J, E
55-06	02/01/05	Boron	89.7	UG/L	
55-06	02/01/05	Boron	90.1	UG/L	
BLR-CH	02/08/05	Boron	16.2	UG/L	B
BLR-DP	03/02/05	Boron	50.5	UG/L	J, E
BLR-DP	03/02/05	Boron	49.3	UG/L	
CS-CH	02/22/05	Boron	25.4	UG/L	
CS-CH	02/22/05	Boron	41.8	UG/L	J, E
MW-10-2	02/02/05	Boron	73.4	UG/L	
MW-10-2	02/03/05	Boron	71.6	UG/L	
MW-1-4	05/18/05	Boron	31.8	UG/L	U
MW-1-4	05/18/05	Boron	32.5	UG/L	U
MW-15	10/11/04	Boron	33.3	UG/L	J, E
MW-15	10/11/04	Boron	31.8	UG/L	J, E
MW-17-2	05/17/05	Boron	58.5	UG/L	
MW-17-2	05/17/05	Boron	47.1	UG/L	
MW-2	02/01/05	Boron	128	UG/L	
MW-2	02/01/05	Boron	134	UG/L	
MW-2	02/01/05	Boron	131	UG/L	
MW-2	02/01/05	Boron	136	UG/L	
MW-20-2	02/09/05	Boron	41.8	UG/L	
MW-20-2	02/09/05	Boron	43.4	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-5-2	02/01/05	Boron	153	UG/L	
MW-5-2	02/01/05	Boron	154	UG/L	
MW-5-2	02/01/05	Boron	145	UG/L	
MW-5-2	02/01/05	Boron	151	UG/L	
MW-6	02/09/05	Boron	55.3	UG/L	
MW-6	02/09/05	Boron	49.2	UG/L	
MW-7-2	02/09/05	Boron	51	UG/L	
MW-7-2	02/09/05	Boron	52.3	UG/L	
MW-9-2	05/18/05	Boron	66.8	UG/L	
MW-9-2	05/18/05	Boron	64	UG/L	
TF-CH	02/08/05	Boron	27.7	UG/L	B
TF-CH	02/08/05	Boron	31.1	UG/L	
ICPP-2019	04/19/05	Boron	91.3	UG/L	
ICPP-2019	04/19/05	Boron	92.8	UG/L	
ICPP-2018	04/19/05	Boron	191	UG/L	
ICPP-2018	04/19/05	Boron	201	UG/L	
ICPP-2018	05/09/05	Boron	205	UG/L	
ICPP-2018	05/09/05	Boron	206	UG/L	
USGS-050	02/16/05	Boron	59.6	UG/L	
USGS-050	02/16/05	Boron	57.5	UG/L	
33-1	05/11/05	Bromide	0.364	MG/L	J
33-2	02/15/05	Bromide	0	MG/L	U
33-3	02/09/05	Bromide	1.88	MG/L	
33-4-1	02/21/05	Bromide	0	UG/L	U
33-4-1	02/21/05	Bromide	0	MG/L	U
37-4	02/21/05	Bromide	0	UG/L	U
37-4	02/21/05	Bromide	0	MG/L	U
55-06	02/01/05	Bromide	0.954	MG/L	
BLR-CH	02/08/05	Bromide	0.698	MG/L	
BLR-DP	03/02/05	Bromide	0	MG/L	U
CS-CH	02/22/05	Bromide	0	UG/L	U
CS-CH	02/22/05	Bromide	0	MG/L	U
MW-10-2	02/02/05	Bromide	0.988	MG/L	
MW-1-4	05/18/05	Bromide	0	MG/L	U
MW-15	10/11/04	Bromide	0	MG/L	U
MW-15	10/11/04	Bromide	0	MG/L	U
MW-17-2	05/17/05	Bromide	0	MG/L	U
MW-2	02/01/05	Bromide	0.971	MG/L	
MW-2	02/01/05	Bromide	0.939	MG/L	
MW-20-2	02/09/05	Bromide	0.914	MG/L	
MW-5-2	02/01/05	Bromide	1.43	MG/L	
MW-5-2	02/01/05	Bromide	1.43	MG/L	
MW-6	02/09/05	Bromide	1.06	MG/L	
MW-7-2	02/09/05	Bromide	0.789	MG/L	
MW-9-2	05/18/05	Bromide	0	MG/L	U
TF-CH	02/08/05	Bromide	1.02	MG/L	
ICPP-2019	04/19/05	Bromide	0.094	MG/L	J
ICPP-2018	04/19/05	Bromide	0.159	MG/L	J
USGS-050	02/16/05	Bromide	0	MG/L	U
33-1	05/11/05	Cadmium	0.19	UG/L	B
33-1	05/11/05	Cadmium	0.1	UG/L	U
33-2	02/15/05	Cadmium	0.04	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
33-2	02/15/05	Cadmium	0.043	UG/L	B
33-3	02/09/05	Cadmium	2.9	UG/L	B
33-3	02/09/05	Cadmium	0.04	UG/L	U
33-4-1	02/21/05	Cadmium	0.04	UG/L	U
33-4-1	02/21/05	Cadmium	0.04	UG/L	U
37-4	02/21/05	Cadmium	0.04	UG/L	U
37-4	02/21/05	Cadmium	0.049	UG/L	B
55-06	02/01/05	Cadmium	0.04	UG/L	U
55-06	02/01/05	Cadmium	0.11	UG/L	B
BLR-CH	02/08/05	Cadmium	0.043	UG/L	B
BLR-DP	03/02/05	Cadmium	0.97	UG/L	B
BLR-DP	03/02/05	Cadmium	0.084	UG/L	B
CS-CH	02/22/05	Cadmium	0.04	UG/L	U
CS-CH	02/22/05	Cadmium	3.3	UG/L	B
MW-10-2	02/02/05	Cadmium	0.43	UG/L	B
MW-10-2	02/03/05	Cadmium	0.075	UG/L	B
MW-1-4	05/18/05	Cadmium	0.1	UG/L	U
MW-1-4	05/18/05	Cadmium	0.1	UG/L	U
MW-15	10/11/04	Cadmium	0.36	UG/L	J, B
MW-15	10/11/04	Cadmium	0.313	UG/L	UJ
MW-17-2	05/17/05	Cadmium	0.4	UG/L	B
MW-17-2	05/17/05	Cadmium	0.1	UG/L	U
MW-2	02/01/05	Cadmium	0.04	UG/L	U
MW-2	02/01/05	Cadmium	0.04	UG/L	U
MW-2	02/01/05	Cadmium	0.04	UG/L	U
MW-2	02/01/05	Cadmium	0.04	UG/L	U
MW-20-2	02/09/05	Cadmium	0.23	UG/L	B
MW-20-2	02/09/05	Cadmium	0.04	UG/L	U
MW-5-2	02/01/05	Cadmium	0.04	UG/L	U
MW-5-2	02/01/05	Cadmium	0.04	UG/L	U
MW-5-2	02/01/05	Cadmium	0.098	UG/L	B
MW-5-2	02/01/05	Cadmium	0.04	UG/L	U
MW-6	02/09/05	Cadmium	0.048	UG/L	B
MW-6	02/09/05	Cadmium	0.14	UG/L	U, B
MW-7-2	02/09/05	Cadmium	0.58	UG/L	B
MW-7-2	02/09/05	Cadmium	0.04	UG/L	U
MW-9-2	05/18/05	Cadmium	0.1	UG/L	U
MW-9-2	05/18/05	Cadmium	0.1	UG/L	U
TF-CH	02/08/05	Cadmium	0.21	UG/L	B
TF-CH	02/08/05	Cadmium	0.04	UG/L	U
ICPP-2019	04/19/05	Cadmium	1	UG/L	U
ICPP-2019	04/19/05	Cadmium	1	UG/L	U
ICPP-2019	05/03/05	Cadmium	1	UG/L	U
ICPP-2018	04/19/05	Cadmium	1	UG/L	U
ICPP-2018	04/19/05	Cadmium	1	UG/L	U
ICPP-2018	05/03/05	Cadmium	1	UG/L	U
ICPP-2018	05/09/05	Cadmium	1	UG/L	U
ICPP-2018	05/09/05	Cadmium	5	UG/L	U
ICPP-2018	05/09/05	Cadmium	5	UG/L	U
USGS-050	02/16/05	Cadmium	0.04	UG/L	U
USGS-050	02/16/05	Cadmium	0.086	UG/L	B
33-1	05/11/05	Calcium	66000	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
33-1	05/11/05	Calcium	57000	UG/L	
33-2	02/15/05	Calcium	52600	UG/L	
33-2	02/15/05	Calcium	55000	UG/L	
33-3	02/09/05	Calcium	183000	UG/L	
33-3	02/09/05	Calcium	178000	UG/L	
33-4-1	02/21/05	Calcium	54600	UG/L	
33-4-1	02/21/05	Calcium	54400	UG/L	
37-4	02/21/05	Calcium	84600	UG/L	
37-4	02/21/05	Calcium	89700	UG/L	
55-06	02/01/05	Calcium	64300	UG/L	
55-06	02/01/05	Calcium	67100	UG/L	
BLR-CH	02/08/05	Calcium	52300	UG/L	
BLR-DP	03/02/05	Calcium	97200	UG/L	
BLR-DP	03/02/05	Calcium	92200	UG/L	
CS-CH	02/22/05	Calcium	69800	UG/L	
CS-CH	02/22/05	Calcium	113000	UG/L	
MW-10-2	02/02/05	Calcium	103000	UG/L	
MW-10-2	02/03/05	Calcium	93400	UG/L	
MW-1-4	05/18/05	Calcium	88200	UG/L	
MW-1-4	05/18/05	Calcium	89100	UG/L	
MW-15	10/11/04	Calcium	49000	UG/L	J
MW-15	10/11/04	Calcium	51400	UG/L	J
MW-17-2	05/17/05	Calcium	32000	UG/L	
MW-17-2	05/17/05	Calcium	6210	UG/L	
MW-2	02/01/05	Calcium	58600	UG/L	
MW-2	02/01/05	Calcium	61100	UG/L	
MW-2	02/01/05	Calcium	59800	UG/L	
MW-2	02/01/05	Calcium	62500	UG/L	
MW-20-2	02/09/05	Calcium	69200	UG/L	
MW-20-2	02/09/05	Calcium	66300	UG/L	
MW-5-2	02/01/05	Calcium	94000	UG/L	
MW-5-2	02/01/05	Calcium	91800	UG/L	
MW-5-2	02/01/05	Calcium	89500	UG/L	
MW-5-2	02/01/05	Calcium	94300	UG/L	
MW-6	02/09/05	Calcium	83400	UG/L	
MW-6	02/09/05	Calcium	83000	UG/L	
MW-7-2	02/09/05	Calcium	48600	UG/L	
MW-7-2	02/09/05	Calcium	37300	UG/L	
MW-9-2	05/18/05	Calcium	40600	UG/L	
MW-9-2	05/18/05	Calcium	41600	UG/L	
TF-CH	02/08/05	Calcium	88200	UG/L	
TF-CH	02/08/05	Calcium	85800	UG/L	
ICPP-2019	04/19/05	Calcium	58900	UG/L	
ICPP-2019	04/19/05	Calcium	58800	UG/L	
ICPP-2019	04/19/05	Calcium	59400	UG/L	
ICPP-2018	04/19/05	Calcium	75600	UG/L	
ICPP-2018	04/19/05	Calcium	73700	UG/L	
ICPP-2018	04/19/05	Calcium	75600	UG/L	
ICPP-2018	05/09/05	Calcium	78800	UG/L	
ICPP-2018	05/09/05	Calcium	79200	UG/L	
USGS-050	02/16/05	Calcium	61900	UG/L	
USGS-050	02/16/05	Calcium	64700	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
33-1	05/11/05	Chloride	18.7	MG/L	J
33-2	02/15/05	Chloride	52	MG/L	
33-3	02/09/05	Chloride	948	MG/L	J
33-4-1	02/21/05	Chloride	20.6	MG/L	
33-4-1	02/21/05	Chloride	20.6	MG/L	
37-4	02/21/05	Chloride	28.3	MG/L	
37-4	02/21/05	Chloride	28.3	MG/L	
55-06	02/01/05	Chloride	42.1	MG/L	
BLR-CH	02/08/05	Chloride	20	MG/L	J
BLR-DP	03/02/05	Chloride	113	MG/L	J
CS-CH	02/22/05	Chloride	82.7	MG/L	
CS-CH	02/22/05	Chloride	82.7	MG/L	
MW-10-2	02/02/05	Chloride	55.7	MG/L	
MW-1-4	05/18/05	Chloride	47.6	MG/L	J
MW-15	10/11/04	Chloride	16.7	MG/L	J
MW-15	10/11/04	Chloride	16.7	MG/L	J
MW-17-2	05/17/05	Chloride	19.7	MG/L	J
MW-2	02/01/05	Chloride	30.5	MG/L	
MW-2	02/01/05	Chloride	30.5	MG/L	
MW-20-2	02/09/05	Chloride	23.2	MG/L	J
MW-5-2	02/01/05	Chloride	41.3	MG/L	
MW-5-2	02/01/05	Chloride	41.1	MG/L	
MW-6	02/09/05	Chloride	84.8	MG/L	J
MW-7-2	02/09/05	Chloride	27.8	MG/L	J
MW-9-2	05/18/05	Chloride	19	MG/L	J
TF-CH	02/08/05	Chloride	28.1	MG/L	J
ICPP-2019	04/19/05	Chloride	25.3	MG/L	J
ICPP-2018	04/19/05	Chloride	43	MG/L	J
USGS-050	02/16/05	Chloride	50.5	MG/L	
33-1	05/11/05	Chromium	62.1	UG/L	
33-1	05/11/05	Chromium	14.4	UG/L	
33-2	02/15/05	Chromium	52.6	UG/L	
33-2	02/15/05	Chromium	2970	UG/L	
33-3	02/09/05	Chromium	24600	UG/L	R, N
33-3	02/09/05	Chromium	42.8	UG/L	
33-4-1	02/21/05	Chromium	11.8	UG/L	
33-4-1	02/21/05	Chromium	15.1	UG/L	
37-4	02/21/05	Chromium	17.4	UG/L	
37-4	02/21/05	Chromium	37.8	UG/L	
55-06	02/01/05	Chromium	0.99	UG/L	U, B, N
55-06	02/01/05	Chromium	34.6	UG/L	*N
BLR-CH	02/08/05	Chromium	3.1	UG/L	B
BLR-DP	03/02/05	Chromium	146	UG/L	
BLR-DP	03/02/05	Chromium	5.3	UG/L	U, B
CS-CH	02/22/05	Chromium	2.5	UG/L	U, B
CS-CH	02/22/05	Chromium	5000	UG/L	
MW-10-2	02/02/05	Chromium	15.8	UG/L	*N
MW-10-2	02/03/05	Chromium	1.7	UG/L	B
MW-1-4	05/18/05	Chromium	4.3	UG/L	U, B
MW-1-4	05/18/05	Chromium	28.2	UG/L	
MW-15	10/11/04	Chromium	6.4	UG/L	J, B
MW-15	10/11/04	Chromium	6.6	UG/L	J, B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-17-2	05/17/05	Chromium	19.1	UG/L	
MW-17-2	05/17/05	Chromium	1.8	UG/L	U, B
MW-2	02/01/05	Chromium	36.8	UG/L	*N
MW-2	02/01/05	Chromium	24.8	UG/L	*N
MW-2	02/01/05	Chromium	0.38	UG/L	U*N
MW-2	02/01/05	Chromium	1	UG/L	U, B, N
MW-20-2	02/09/05	Chromium	84.5	UG/L	R, N
MW-20-2	02/09/05	Chromium	6.3	UG/L	B
MW-5-2	02/01/05	Chromium	0.38	UG/L	U*N
MW-5-2	02/01/05	Chromium	0.38	UG/L	U*N
MW-5-2	02/01/05	Chromium	0.38	UG/L	U*N
MW-5-2	02/01/05	Chromium	0.38	UG/L	U*N
MW-6	02/09/05	Chromium	6.3	UG/L	B
MW-6	02/09/05	Chromium	13.2	UG/L	R, N
MW-7-2	02/09/05	Chromium	25.5	UG/L	R, N
MW-7-2	02/09/05	Chromium	8.8	UG/L	B
MW-9-2	05/18/05	Chromium	5.5	UG/L	B
MW-9-2	05/18/05	Chromium	6.7	UG/L	B
TF-CH	02/08/05	Chromium	10.4	UG/L	R, N
TF-CH	02/08/05	Chromium	4.2	UG/L	B
ICPP-2019	04/19/05	Chromium	5.5	UG/L	U, B
ICPP-2019	04/19/05	Chromium	6.9	UG/L	U, B
ICPP-2019	05/03/05	Chromium	5.8	UG/L	B
ICPP-2018	04/19/05	Chromium	1.6	UG/L	U, B
ICPP-2018	04/19/05	Chromium	2.2	UG/L	U, B
ICPP-2018	05/03/05	Chromium	5	UG/L	U
ICPP-2018	05/09/05	Chromium	5	UG/L	U
ICPP-2018	05/09/05	Chromium	1.2	UG/L	U
ICPP-2018	05/09/05	Chromium	1.2	UG/L	U
USGS-050	02/16/05	Chromium	3.2	UG/L	B
USGS-050	02/16/05	Chromium	121	UG/L	
33-1	05/11/05	Cobalt	3	UG/L	B
33-1	05/11/05	Cobalt	0.2	UG/L	B
33-2	02/15/05	Cobalt	0.72	UG/L	B
33-2	02/15/05	Cobalt	7.4	UG/L	B
33-3	02/09/05	Cobalt	108	UG/L	
33-3	02/09/05	Cobalt	0.72	UG/L	B
33-4-1	02/21/05	Cobalt	0.32	UG/L	B
33-4-1	02/21/05	Cobalt	0.39	UG/L	B
37-4	02/21/05	Cobalt	1.5	UG/L	B
37-4	02/21/05	Cobalt	1.6	UG/L	B
55-06	02/01/05	Cobalt	0.27	UG/L	B
55-06	02/01/05	Cobalt	2	UG/L	B
BLR-CH	02/08/05	Cobalt	0.14	UG/L	B
BLR-DP	03/02/05	Cobalt	5.7	UG/L	B
BLR-DP	03/02/05	Cobalt	1.4	UG/L	B
CS-CH	02/22/05	Cobalt	3.5	UG/L	B
CS-CH	02/22/05	Cobalt	88	UG/L	
MW-10-2	02/02/05	Cobalt	8.8	UG/L	B
MW-10-2	02/03/05	Cobalt	0.42	UG/L	B
MW-1-4	05/18/05	Cobalt	0.45	UG/L	B
MW-1-4	05/18/05	Cobalt	1.5	UG/L	B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-15	10/11/04	Cobalt	0.541	UG/L	UJ
MW-15	10/11/04	Cobalt	0.541	UG/L	UJ
MW-17-2	05/17/05	Cobalt	6.7	UG/L	B
MW-17-2	05/17/05	Cobalt	0.2	UG/L	B
MW-2	02/01/05	Cobalt	0.73	UG/L	B
MW-2	02/01/05	Cobalt	0.84	UG/L	B
MW-2	02/01/05	Cobalt	0.51	UG/L	B
MW-2	02/01/05	Cobalt	0.6	UG/L	B
MW-20-2	02/09/05	Cobalt	3.9	UG/L	B
MW-20-2	02/09/05	Cobalt	0.37	UG/L	B
MW-5-2	02/01/05	Cobalt	0.5	UG/L	B
MW-5-2	02/01/05	Cobalt	0.45	UG/L	B
MW-5-2	02/01/05	Cobalt	0.4	UG/L	B
MW-5-2	02/01/05	Cobalt	0.45	UG/L	B
MW-6	02/09/05	Cobalt	0.73	UG/L	B
MW-6	02/09/05	Cobalt	0.94	UG/L	B
MW-7-2	02/09/05	Cobalt	8.6	UG/L	B
MW-7-2	02/09/05	Cobalt	0.54	UG/L	B
MW-9-2	05/18/05	Cobalt	0.14	UG/L	B
MW-9-2	05/18/05	Cobalt	0.24	UG/L	B
TF-CH	02/08/05	Cobalt	0.49	UG/L	B
TF-CH	02/08/05	Cobalt	0.2	UG/L	B
ICPP-2019	04/19/05	Cobalt	1.9	UG/L	U, B
ICPP-2019	04/19/05	Cobalt	3.2	UG/L	U, B
ICPP-2018	04/19/05	Cobalt	2	UG/L	U, B
ICPP-2018	04/19/05	Cobalt	3.1	UG/L	U, B
ICPP-2018	05/09/05	Cobalt	5	UG/L	U
ICPP-2018	05/09/05	Cobalt	5	UG/L	U
USGS-050	02/16/05	Cobalt	0.39	UG/L	B
USGS-050	02/16/05	Cobalt	4.2	UG/L	B
33-1	05/11/05	Copper	8.9	UG/L	B
33-1	05/11/05	Copper	1.6	UG/L	B
33-2	02/15/05	Copper	1.2	UG/L	B
33-2	02/15/05	Copper	50.4	UG/L	
33-3	02/09/05	Copper	346	UG/L	
33-3	02/09/05	Copper	2	UG/L	B
33-4-1	02/21/05	Copper	1.6	UG/L	B
33-4-1	02/21/05	Copper	2.4	UG/L	B
37-4	02/21/05	Copper	5	UG/L	B
37-4	02/21/05	Copper	7.1	UG/L	B
55-06	02/01/05	Copper	1.4	UG/L	B
55-06	02/01/05	Copper	8.8	UG/L	B
BLR-CH	02/08/05	Copper	2.1	UG/L	B
BLR-DP	03/02/05	Copper	54.3	UG/L	
BLR-DP	03/02/05	Copper	8.2	UG/L	B
CS-CH	02/22/05	Copper	1.3	UG/L	B
CS-CH	02/22/05	Copper	339	UG/L	
MW-10-2	02/02/05	Copper	11.1	UG/L	B
MW-10-2	02/03/05	Copper	1.7	UG/L	B
MW-1-4	05/18/05	Copper	1.7	UG/L	B
MW-1-4	05/18/05	Copper	7.6	UG/L	B
MW-15	10/11/04	Copper	1.39	UG/L	UJ

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-15	10/11/04	Copper	1.39	UG/L	UJ
MW-17-2	05/17/05	Copper	15.8	UG/L	B
MW-17-2	05/17/05	Copper	1.8	UG/L	B
MW-2	02/01/05	Copper	2.2	UG/L	B
MW-2	02/01/05	Copper	2.9	UG/L	B
MW-2	02/01/05	Copper	1	UG/L	B
MW-2	02/01/05	Copper	1.3	UG/L	B
MW-20-2	02/09/05	Copper	23.5	UG/L	B
MW-20-2	02/09/05	Copper	3.5	UG/L	B
MW-5-2	02/01/05	Copper	2.6	UG/L	B
MW-5-2	02/01/05	Copper	2.2	UG/L	B
MW-5-2	02/01/05	Copper	2	UG/L	B
MW-5-2	02/01/05	Copper	2.2	UG/L	B
MW-6	02/09/05	Copper	2.2	UG/L	B
MW-6	02/09/05	Copper	8	UG/L	B
MW-7-2	02/09/05	Copper	19.6	UG/L	B
MW-7-2	02/09/05	Copper	2.7	UG/L	B
MW-9-2	05/18/05	Copper	1	UG/L	U, B
MW-9-2	05/18/05	Copper	2.6	UG/L	B
TF-CH	02/08/05	Copper	6.6	UG/L	B
TF-CH	02/08/05	Copper	1.3	UG/L	B
ICPP-2019	04/19/05	Copper	3	UG/L	U
ICPP-2019	04/19/05	Copper	3	UG/L	U
ICPP-2018	04/19/05	Copper	3	UG/L	U
ICPP-2018	04/19/05	Copper	3	UG/L	U
ICPP-2018	05/09/05	Copper	5	UG/L	U
ICPP-2018	05/09/05	Copper	5	UG/L	U
USGS-050	02/16/05	Copper	1.3	UG/L	B
USGS-050	02/16/05	Copper	29.5	UG/L	
ICPP-2019	05/03/05	Cyanide	5	UG/L	U
ICPP-2018	05/03/05	Cyanide	5	UG/L	U
ICPP-2018	05/09/05	Cyanide	5	UG/L	U
ICPP-2018	05/09/05	Cyanide	5	UG/L	U
ICPP-2018	05/09/05	Cyanide	5	UG/L	U
33-1	05/11/05	Fluoride	0.157	MG/L	J
33-2	02/15/05	Fluoride	0.205	MG/L	J
33-3	02/09/05	Fluoride	0.114	MG/L	J
33-4-1	02/21/05	Fluoride	0.173	MG/L	J
33-4-1	02/21/05	Fluoride	0.173	MG/L	J
37-4	02/21/05	Fluoride	0.197	MG/L	J
37-4	02/21/05	Fluoride	0.197	MG/L	J
55-06	02/01/05	Fluoride	0.108	MG/L	J
BLR-CH	02/08/05	Fluoride	0.151	MG/L	J
BLR-DP	03/02/05	Fluoride	0.652	MG/L	
CS-CH	02/22/05	Fluoride	0.242	MG/L	J
CS-CH	02/22/05	Fluoride	0.242	MG/L	J
MW-10-2	02/02/05	Fluoride	0.103	MG/L	J
MW-1-4	05/18/05	Fluoride	0	MG/L	U
MW-15	10/11/04	Fluoride	0.265	MG/L	J
MW-15	10/11/04	Fluoride	0.268	MG/L	J
MW-17-2	05/17/05	Fluoride	0.147	MG/L	J
MW-2	02/01/05	Fluoride	0.169	MG/L	J

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-2	02/01/05	Fluoride	0.188	MG/L	J
MW-20-2	02/09/05	Fluoride	0.138	MG/L	J
MW-5-2	02/01/05	Fluoride	0.197	MG/L	J
MW-5-2	02/01/05	Fluoride	0.161	MG/L	J
MW-6	02/09/05	Fluoride	0.141	MG/L	J
MW-7-2	02/09/05	Fluoride	0.23	MG/L	J
MW-9-2	05/18/05	Fluoride	0.228	MG/L	J
TF-CH	02/08/05	Fluoride	0.07	MG/L	J
ICPP-2019	04/19/05	Fluoride	0.347	MG/L	J
ICPP-2018	04/19/05	Fluoride	0.479	MG/L	J
USGS-050	02/16/05	Fluoride	0.339	MG/L	J
33-1	05/11/05	Iron	5320	UG/L	
33-1	05/11/05	Iron	303	UG/L	
33-2	02/15/05	Iron	300	UG/L	
33-2	02/15/05	Iron	11900	UG/L	
33-3	02/09/05	Iron	181000	UG/L	R, E
33-3	02/09/05	Iron	1030	UG/L	
33-4-1	02/21/05	Iron	394	UG/L	
33-4-1	02/21/05	Iron	448	UG/L	
37-4	02/21/05	Iron	650	UG/L	
37-4	02/21/05	Iron	1190	UG/L	
55-06	02/01/05	Iron	214	UG/L	J, E
55-06	02/01/05	Iron	2900	UG/L	J, E
BLR-CH	02/08/05	Iron	288	UG/L	
BLR-DP	03/02/05	Iron	11300	UG/L	
BLR-DP	03/02/05	Iron	645	UG/L	
CS-CH	02/22/05	Iron	475	UG/L	
CS-CH	02/22/05	Iron	180000	UG/L	
MW-10-2	02/02/05	Iron	12800	UG/L	J, E
MW-10-2	02/03/05	Iron	535	UG/L	
MW-1-4	05/18/05	Iron	474	UG/L	
MW-1-4	05/18/05	Iron	2640	UG/L	
MW-15	10/11/04	Iron	12.6	UG/L	UJ
MW-15	10/11/04	Iron	12.6	UG/L	UJ
MW-17-2	05/17/05	Iron	63700	UG/L	
MW-17-2	05/17/05	Iron	46.6	UG/L	B
MW-2	02/01/05	Iron	316	UG/L	J, E
MW-2	02/01/05	Iron	312	UG/L	J, E
MW-2	02/01/05	Iron	207	UG/L	J, E
MW-2	02/01/05	Iron	215	UG/L	J, E
MW-20-2	02/09/05	Iron	5300	UG/L	R, E
MW-20-2	02/09/05	Iron	364	UG/L	
MW-5-2	02/01/05	Iron	318	UG/L	J, E
MW-5-2	02/01/05	Iron	390	UG/L	J, E
MW-5-2	02/01/05	Iron	298	UG/L	J, E
MW-5-2	02/01/05	Iron	329	UG/L	J, E
MW-6	02/09/05	Iron	466	UG/L	
MW-6	02/09/05	Iron	445	UG/L	R, E
MW-7-2	02/09/05	Iron	6980	UG/L	R, E
MW-7-2	02/09/05	Iron	208	UG/L	
MW-9-2	05/18/05	Iron	217	UG/L	
MW-9-2	05/18/05	Iron	437	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
TF-CH	02/08/05	Iron	818	UG/L	R, E
TF-CH	02/08/05	Iron	457	UG/L	
ICPP-2019	04/19/05	Iron	18	UG/L	U
ICPP-2019	04/19/05	Iron	379	UG/L	
ICPP-2018	04/19/05	Iron	1650	UG/L	
ICPP-2018	04/19/05	Iron	1710	UG/L	
ICPP-2018	05/09/05	Iron	2090	UG/L	
ICPP-2018	05/09/05	Iron	2030	UG/L	
USGS-050	02/16/05	Iron	346	UG/L	
USGS-050	02/16/05	Iron	12200	UG/L	
33-1	05/11/05	Lead	1.9	UG/L	B
33-1	05/11/05	Lead	0.5	UG/L	U
33-2	02/15/05	Lead	0.072	UG/L	B
33-2	02/15/05	Lead	4.8	UG/L	B
33-3	02/09/05	Lead	104	UG/L	
33-3	02/09/05	Lead	0.05	UG/L	U
33-4-1	02/21/05	Lead	0.78	UG/L	B
33-4-1	02/21/05	Lead	0.18	UG/L	B
37-4	02/21/05	Lead	1.1	UG/L	B
37-4	02/21/05	Lead	0.61	UG/L	B
55-06	02/01/05	Lead	0.05	UG/L	U
55-06	02/01/05	Lead	1.2	UG/L	B
BLR-CH	02/08/05	Lead	0.14	UG/L	B
BLR-DP	03/02/05	Lead	174	UG/L	
BLR-DP	03/02/05	Lead	6.6	UG/L	B
CS-CH	02/22/05	Lead	0.089	UG/L	B
CS-CH	02/22/05	Lead	132	UG/L	
MW-10-2	02/02/05	Lead	4.7	UG/L	B
MW-10-2	02/03/05	Lead	0.36	UG/L	B
MW-1-4	05/18/05	Lead	0.5	UG/L	U
MW-1-4	05/18/05	Lead	2.3	UG/L	B
MW-15	10/11/04	Lead	1.72	UG/L	UJ
MW-15	10/11/04	Lead	1.72	UG/L	UJ
MW-17-2	05/17/05	Lead	22.1	UG/L	B
MW-17-2	05/17/05	Lead	0.5	UG/L	U
MW-2	02/01/05	Lead	0.061	UG/L	U
MW-2	02/01/05	Lead	0.091	UG/L	U
MW-2	02/01/05	Lead	0.05	UG/L	U
MW-2	02/01/05	Lead	0.05	UG/L	U
MW-20-2	02/09/05	Lead	2.4	UG/L	B
MW-20-2	02/09/05	Lead	0.75	UG/L	B
MW-5-2	02/01/05	Lead	0.059	UG/L	U, B
MW-5-2	02/01/05	Lead	0.078	UG/L	U, B
MW-5-2	02/01/05	Lead	0.053	UG/L	U, B
MW-5-2	02/01/05	Lead	0.054	UG/L	U, B
MW-6	02/09/05	Lead	0.83	UG/L	B
MW-6	02/09/05	Lead	0.12	UG/L	B
MW-7-2	02/09/05	Lead	10.7	UG/L	B
MW-7-2	02/09/05	Lead	0.063	UG/L	B
MW-9-2	05/18/05	Lead	0.5	UG/L	U
MW-9-2	05/18/05	Lead	0.62	UG/L	B
TF-CH	02/08/05	Lead	0.73	UG/L	B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
TF-CH	02/08/05	Lead	0.05	UG/L	U
ICPP-2019	04/19/05	Lead	2.5	UG/L	U
ICPP-2019	04/19/05	Lead	2.5	UG/L	U
ICPP-2019	05/03/05	Lead	3	UG/L	U
ICPP-2018	04/19/05	Lead	2.5	UG/L	U
ICPP-2018	04/19/05	Lead	3.1	UG/L	U
ICPP-2018	05/03/05	Lead	3	UG/L	U
ICPP-2018	05/09/05	Lead	3	UG/L	U
ICPP-2018	05/09/05	Lead	1.2	UG/L	U
ICPP-2018	05/09/05	Lead	1.2	UG/L	U
USGS-050	02/16/05	Lead	0.88	UG/L	B
USGS-050	02/16/05	Lead	7.9	UG/L	B
ICPP-2019	04/19/05	Lithium	2.5	UG/L	B
ICPP-2019	04/19/05	Lithium	2.9	UG/L	B
ICPP-2018	04/19/05	Lithium	4	UG/L	B
ICPP-2018	04/19/05	Lithium	4.2	UG/L	B
ICPP-2018	05/09/05	Lithium	10	UG/L	U
ICPP-2018	05/09/05	Lithium	10	UG/L	U
33-1	05/11/05	Magnesium	18800	UG/L	
33-1	05/11/05	Magnesium	17600	UG/L	
33-2	02/15/05	Magnesium	14600	UG/L	
33-2	02/15/05	Magnesium	15900	UG/L	
33-3	02/09/05	Magnesium	71300	UG/L	E
33-3	02/09/05	Magnesium	63900	UG/L	
33-4-1	02/21/05	Magnesium	14200	UG/L	
33-4-1	02/21/05	Magnesium	13600	UG/L	
37-4	02/21/05	Magnesium	28400	UG/L	
37-4	02/21/05	Magnesium	26700	UG/L	
55-06	02/01/05	Magnesium	17000	UG/L	J, E
55-06	02/01/05	Magnesium	17500	UG/L	J, E
BLR-CH	02/08/05	Magnesium	12900	UG/L	
BLR-DP	03/02/05	Magnesium	29000	UG/L	
BLR-DP	03/02/05	Magnesium	28200	UG/L	
CS-CH	02/22/05	Magnesium	18100	UG/L	
CS-CH	02/22/05	Magnesium	72900	UG/L	
MW-10-2	02/02/05	Magnesium	33300	UG/L	J, E
MW-10-2	02/03/05	Magnesium	27700	UG/L	
MW-1-4	05/18/05	Magnesium	26700	UG/L	
MW-1-4	05/18/05	Magnesium	26700	UG/L	
MW-15	10/11/04	Magnesium	13800	UG/L	J
MW-15	10/11/04	Magnesium	14400	UG/L	J
MW-17-2	05/17/05	Magnesium	7190	UG/L	
MW-17-2	05/17/05	Magnesium	1180	UG/L	
MW-2	02/01/05	Magnesium	17000	UG/L	J
MW-2	02/01/05	Magnesium	17500	UG/L	J
MW-2	02/01/05	Magnesium	16500	UG/L	J
MW-2	02/01/05	Magnesium	17300	UG/L	J
MW-20-2	02/09/05	Magnesium	19400	UG/L	
MW-20-2	02/09/05	Magnesium	18800	UG/L	
MW-5-2	02/01/05	Magnesium	35900	UG/L	J
MW-5-2	02/01/05	Magnesium	37300	UG/L	J
MW-5-2	02/01/05	Magnesium	32500	UG/L	J

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-5-2	02/01/05	Magnesium	39200	UG/L	J
MW-6	02/09/05	Magnesium	20400	UG/L	
MW-6	02/09/05	Magnesium	20300	UG/L	E
MW-7-2	02/09/05	Magnesium	11200	UG/L	E
MW-7-2	02/09/05	Magnesium	11100	UG/L	
MW-9-2	05/18/05	Magnesium	11300	UG/L	
MW-9-2	05/18/05	Magnesium	11500	UG/L	
TF-CH	02/08/05	Magnesium	21900	UG/L	E
TF-CH	02/08/05	Magnesium	22000	UG/L	
ICPP-2019	04/19/05	Magnesium	15800	UG/L	
ICPP-2019	04/19/05	Magnesium	15300	UG/L	
ICPP-2019	04/19/05	Magnesium	15600	UG/L	
ICPP-2018	04/19/05	Magnesium	45500	UG/L	
ICPP-2018	04/19/05	Magnesium	42400	UG/L	
ICPP-2018	04/19/05	Magnesium	44400	UG/L	
ICPP-2018	05/09/05	Magnesium	46400	UG/L	
ICPP-2018	05/09/05	Magnesium	46500	UG/L	
USGS-050	02/16/05	Magnesium	18300	UG/L	
USGS-050	02/16/05	Magnesium	20300	UG/L	
33-1	05/11/05	Manganese	80.9	UG/L	
33-1	05/11/05	Manganese	1	UG/L	U
33-2	02/15/05	Manganese	5.9	UG/L	B
33-2	02/15/05	Manganese	60.9	UG/L	
33-3	02/09/05	Manganese	1000	UG/L	
33-3	02/09/05	Manganese	1.61	UG/L	U
33-4-1	02/21/05	Manganese	3.2	UG/L	B
33-4-1	02/21/05	Manganese	4.5	UG/L	B
37-4	02/21/05	Manganese	10.3	UG/L	B
37-4	02/21/05	Manganese	36.1	UG/L	
55-06	02/01/05	Manganese	1.7	UG/L	B
55-06	02/01/05	Manganese	51.2	UG/L	
BLR-CH	02/08/05	Manganese	3.1	UG/L	B
BLR-DP	03/02/05	Manganese	195	UG/L	
BLR-DP	03/02/05	Manganese	49.8	UG/L	
CS-CH	02/22/05	Manganese	189	UG/L	
CS-CH	02/22/05	Manganese	2190	UG/L	
MW-10-2	02/02/05	Manganese	216	UG/L	
MW-10-2	02/03/05	Manganese	1.61	UG/L	U
MW-1-4	05/18/05	Manganese	7.3	UG/L	B
MW-1-4	05/18/05	Manganese	40.5	UG/L	
MW-15	10/11/04	Manganese	0.72	UG/L	J, B
MW-15	10/11/04	Manganese	0.76	UG/L	J, B
MW-17-2	05/17/05	Manganese	1220	UG/L	
MW-17-2	05/17/05	Manganese	2.2	UG/L	B
MW-2	02/01/05	Manganese	1.7	UG/L	B
MW-2	02/01/05	Manganese	1.8	UG/L	B
MW-2	02/01/05	Manganese	1.61	UG/L	U
MW-2	02/01/05	Manganese	1.61	UG/L	U
MW-20-2	02/09/05	Manganese	94.2	UG/L	
MW-20-2	02/09/05	Manganese	3.9	UG/L	B
MW-5-2	02/01/05	Manganese	106	UG/L	
MW-5-2	02/01/05	Manganese	80.4	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-5-2	02/01/05	Manganese	80.1	UG/L	
MW-5-2	02/01/05	Manganese	84.7	UG/L	
MW-6	02/09/05	Manganese	2.4	UG/L	B
MW-6	02/09/05	Manganese	3.7	UG/L	B
MW-7-2	02/09/05	Manganese	133	UG/L	
MW-7-2	02/09/05	Manganese	1.61	UG/L	U
MW-9-2	05/18/05	Manganese	1	UG/L	U
MW-9-2	05/18/05	Manganese	5.3	UG/L	B
TF-CH	02/08/05	Manganese	14	UG/L	B
TF-CH	02/08/05	Manganese	1.61	UG/L	U
ICPP-2019	04/19/05	Manganese	2	UG/L	U
ICPP-2019	04/19/05	Manganese	7.8	UG/L	B
ICPP-2018	04/19/05	Manganese	588	UG/L	
ICPP-2018	04/19/05	Manganese	639	UG/L	
ICPP-2018	05/09/05	Manganese	676	UG/L	
ICPP-2018	05/09/05	Manganese	670	UG/L	
USGS-050	02/16/05	Manganese	9.9	UG/L	B
USGS-050	02/16/05	Manganese	141	UG/L	
33-1	05/11/05	Mercury	0.05	UG/L	U
33-1	05/11/05	Mercury	0.05	UG/L	U
33-2	02/15/05	Mercury	0.0472	UG/L	U
33-2	02/15/05	Mercury	0.0472	UG/L	U
33-3	02/09/05	Mercury	0.0472	UG/L	U
33-3	02/09/05	Mercury	0.0472	UG/L	U
33-4-1	02/21/05	Mercury	0.0472	UG/L	U
33-4-1	02/21/05	Mercury	0.0472	UG/L	U
37-4	02/21/05	Mercury	0.0472	UG/L	U
37-4	02/21/05	Mercury	0.0472	UG/L	U
55-06	02/01/05	Mercury	0.0472	UG/L	U
55-06	02/01/05	Mercury	0.0472	UG/L	U
BLR-CH	02/08/05	Mercury	0.0472	UG/L	U
BLR-DP	03/02/05	Mercury	0.0472	UG/L	U
BLR-DP	03/02/05	Mercury	0.0472	UG/L	U
CS-CH	02/22/05	Mercury	0.0472	UG/L	U
CS-CH	02/22/05	Mercury	0.0472	UG/L	U
MW-10-2	02/02/05	Mercury	0.0472	UG/L	U
MW-10-2	02/03/05	Mercury	0.0472	UG/L	U
MW-1-4	05/18/05	Mercury	0.05	UG/L	U
MW-1-4	05/18/05	Mercury	0.05	UG/L	U
MW-15	10/11/04	Mercury	0.0472	UG/L	UJ
MW-15	10/11/04	Mercury	0.0472	UG/L	UJ
MW-17-2	05/17/05	Mercury	0.05	UG/L	U
MW-17-2	05/17/05	Mercury	0.05	UG/L	U
MW-2	02/01/05	Mercury	0.0472	UG/L	U
MW-2	02/01/05	Mercury	0.0472	UG/L	U
MW-2	02/01/05	Mercury	0.0472	UG/L	U
MW-2	02/01/05	Mercury	0.0472	UG/L	U
MW-20-2	02/09/05	Mercury	0.0472	UG/L	U
MW-20-2	02/09/05	Mercury	0.0472	UG/L	U
MW-5-2	02/01/05	Mercury	0.0472	UG/L	U
MW-5-2	02/01/05	Mercury	0.0472	UG/L	U
MW-5-2	02/01/05	Mercury	0.0472	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-5-2	02/01/05	Mercury	0.0472	UG/L	U
MW-6	02/09/05	Mercury	0.0472	UG/L	U
MW-6	02/09/05	Mercury	0.0472	UG/L	U
MW-7-2	02/09/05	Mercury	0.2	UG/L	
MW-7-2	02/09/05	Mercury	0.0472	UG/L	U
MW-9-2	05/18/05	Mercury	0.05	UG/L	U
MW-9-2	05/18/05	Mercury	0.05	UG/L	U
TF-CH	02/08/05	Mercury	0.0472	UG/L	U
TF-CH	02/08/05	Mercury	0.0472	UG/L	U
ICPP-2019	04/19/05	Mercury	0.05	UG/L	U
ICPP-2019	04/19/05	Mercury	0.05	UG/L	U
ICPP-2019	04/19/05	Mercury	0.05	UG/L	U
ICPP-2019	05/03/05	Mercury	0.2	UG/L	U
ICPP-2018	04/19/05	Mercury	0.05	UG/L	U
ICPP-2018	04/19/05	Mercury	0.05	UG/L	U
ICPP-2018	04/19/05	Mercury	0.05	UG/L	U
ICPP-2018	05/03/05	Mercury	0.2	UG/L	U
ICPP-2018	05/09/05	Mercury	0.2	UG/L	U
ICPP-2018	05/09/05	Mercury	0.1	UG/L	U
ICPP-2018	05/09/05	Mercury	0.1	UG/L	U
USGS-050	02/16/05	Mercury	0.0472	UG/L	U
USGS-050	02/16/05	Mercury	1.5	UG/L	
ICPP-2019	04/19/05	Molybdenum	2	UG/L	U
ICPP-2019	04/19/05	Molybdenum	2.8	UG/L	U, B
ICPP-2018	04/19/05	Molybdenum	5.7	UG/L	U, B
ICPP-2018	04/19/05	Molybdenum	7.3	UG/L	U, B
ICPP-2018	05/09/05	Molybdenum	5	UG/L	U
ICPP-2018	05/09/05	Molybdenum	5	UG/L	U
33-1	05/11/05	Nickel	22.8	UG/L	B
33-1	05/11/05	Nickel	2.5	UG/L	B
33-2	02/15/05	Nickel	47.4	UG/L	
33-2	02/15/05	Nickel	125	UG/L	
33-3	02/09/05	Nickel	1590	UG/L	
33-3	02/09/05	Nickel	86	UG/L	
33-4-1	02/21/05	Nickel	6.6	UG/L	B
33-4-1	02/21/05	Nickel	8.2	UG/L	J, B, E
37-4	02/21/05	Nickel	12.4	UG/L	B
37-4	02/21/05	Nickel	30.1	UG/L	J, B, E
55-06	02/01/05	Nickel	5.7	UG/L	B
55-06	02/01/05	Nickel	28	UG/L	B
BLR-CH	02/08/05	Nickel	4.1	UG/L	B
BLR-DP	03/02/05	Nickel	147	UG/L	J, E
BLR-DP	03/02/05	Nickel	47	UG/L	
CS-CH	02/22/05	Nickel	226	UG/L	
CS-CH	02/22/05	Nickel	1480	UG/L	J, E
MW-10-2	02/02/05	Nickel	15.3	UG/L	B
MW-10-2	02/03/05	Nickel	2.6	UG/L	B
MW-1-4	05/18/05	Nickel	5.6	UG/L	B
MW-1-4	05/18/05	Nickel	15.6	UG/L	B
MW-15	10/11/04	Nickel	0.69	UG/L	UJ
MW-15	10/11/04	Nickel	0.69	UG/L	UJ
MW-17-2	05/17/05	Nickel	16.6	UG/L	B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-17-2	05/17/05	Nickel	1.3	UG/L	B
MW-2	02/01/05	Nickel	4.8	UG/L	B
MW-2	02/01/05	Nickel	5.3	UG/L	B
MW-2	02/01/05	Nickel	2.9	UG/L	B
MW-2	02/01/05	Nickel	3.2	UG/L	B
MW-20-2	02/09/05	Nickel	54.3	UG/L	
MW-20-2	02/09/05	Nickel	14.9	UG/L	B
MW-5-2	02/01/05	Nickel	4.7	UG/L	B
MW-5-2	02/01/05	Nickel	3.9	UG/L	B
MW-5-2	02/01/05	Nickel	3.6	UG/L	B
MW-5-2	02/01/05	Nickel	4	UG/L	B
MW-6	02/09/05	Nickel	15.5	UG/L	B
MW-6	02/09/05	Nickel	12	UG/L	B
MW-7-2	02/09/05	Nickel	11.6	UG/L	B
MW-7-2	02/09/05	Nickel	2.4	UG/L	B
MW-9-2	05/18/05	Nickel	1.4	UG/L	B
MW-9-2	05/18/05	Nickel	1.6	UG/L	B
TF-CH	02/08/05	Nickel	7.3	UG/L	B
TF-CH	02/08/05	Nickel	2.8	UG/L	B
ICPP-2019	04/19/05	Nickel	1	UG/L	UJ
ICPP-2019	04/19/05	Nickel	1.3	UG/L	J, B
ICPP-2018	04/19/05	Nickel	1	UG/L	UJ
ICPP-2018	04/19/05	Nickel	1	UG/L	UJ
ICPP-2018	05/09/05	Nickel	5	UG/L	U
ICPP-2018	05/09/05	Nickel	5	UG/L	U
USGS-050	02/16/05	Nickel	10.8	UG/L	B
USGS-050	02/16/05	Nickel	54.1	UG/L	
33-1	05/11/05	Nitrate+NitriteF as Nitrogen	20.9	MG/L	
33-2	02/15/05	Nitrate+Nitrite as Nitrogen	5.43	MG/L	
33-3	02/09/05	Nitrate+Nitrite as Nitrogen	0.772	MG/L	
33-4-1	02/21/05	Nitrate+Nitrite as Nitrogen	3.4	MG/L	
37-4	02/21/05	Nitrate+Nitrite as Nitrogen	24.9	MG/L	
55-06	02/01/05	Nitrate+Nitrite as Nitrogen	4.89	MG/L	
BLR-CH	02/08/05	Nitrate+Nitrite as Nitrogen	4.88	MG/L	
BLR-DP	03/02/05	Nitrate+Nitrite as Nitrogen	4.73	MG/L	
CS-CH	02/22/05	Nitrate+Nitrite as Nitrogen	1.04	MG/L	
MW-10-2	02/02/05	Nitrate+Nitrite as Nitrogen	4.97	MG/L	
MW-1-4	05/18/05	Nitrate+Nitrite as Nitrogen	41.4	MG/L	
MW-15	10/11/04	Nitrate+Nitrite as Nitrogen	2.95	MG/L	
MW-15	10/11/04	Nitrate+Nitrite as Nitrogen	3.01	MG/L	
MW-17-2	05/17/05	Nitrate+Nitrite as Nitrogen	3.07	MG/L	
MW-2	02/01/05	Nitrate+Nitrite as Nitrogen	7.77	MG/L	
MW-2	02/01/05	Nitrate+Nitrite as Nitrogen	7.87	MG/L	
MW-20-2	02/09/05	Nitrate+Nitrite as Nitrogen	5.03	MG/L	
MW-5-2	02/01/05	Nitrate+Nitrite as Nitrogen	4.98	MG/L	
MW-5-2	02/01/05	Nitrate+Nitrite as Nitrogen	4.93	MG/L	
MW-6	02/09/05	Nitrate+Nitrite as Nitrogen	3.45	MG/L	
MW-7-2	02/09/05	Nitrate+Nitrite as Nitrogen	6.11	MG/L	
MW-9-2	05/18/05	Nitrate+Nitrite as Nitrogen	11	MG/L	
TF-CH	02/08/05	Nitrate+Nitrite as Nitrogen	8.13	MG/L	
ICPP-2019	04/19/05	Nitrate+Nitrite as Nitrogen	6.69	MG/L	J
ICPP-2018	04/19/05	Nitrate+Nitrite as Nitrogen	0.339	MG/L	J

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
USGS-050	02/16/05	Nitrate+Nitrite as Nitrogen	28.6	MG/L	
MW-15	10/11/04	Total Kjeldahl Nitrogen (TKN)	0.078	MG/L	J
MW-15	10/11/04	Total Kjeldahl Nitrogen (TKN)	0.055	MG/L	J
33-1	05/11/05	Potassium	4760	UG/L	B
33-1	05/11/05	Potassium	4420	UG/L	B
33-2	02/15/05	Potassium	4260	UG/L	B
33-2	02/15/05	Potassium	3650	UG/L	B
33-3	02/09/05	Potassium	15500	UG/L	J, E
33-3	02/09/05	Potassium	13800	UG/L	
33-4-1	02/21/05	Potassium	2520	UG/L	B
33-4-1	02/21/05	Potassium	2630	UG/L	B
37-4	02/21/05	Potassium	3850	UG/L	B
37-4	02/21/05	Potassium	4250	UG/L	B
55-06	02/01/05	Potassium	3550	UG/L	J, B, E
55-06	02/01/05	Potassium	3830	UG/L	J, B, E
BLR-CH	02/08/05	Potassium	2770	UG/L	B
BLR-DP	03/02/05	Potassium	7050	UG/L	
BLR-DP	03/02/05	Potassium	6280	UG/L	
CS-CH	02/22/05	Potassium	3780	UG/L	B
CS-CH	02/22/05	Potassium	7420	UG/L	
MW-10-2	02/02/05	Potassium	6830	UG/L	J, E
MW-10-2	02/03/05	Potassium	5370	UG/L	
MW-1-4	05/18/05	Potassium	5690	UG/L	
MW-1-4	05/18/05	Potassium	5720	UG/L	
MW-15	10/11/04	Potassium	2900	UG/L	J, B
MW-15	10/11/04	Potassium	3070	UG/L	J, B
MW-17-2	05/17/05	Potassium	14500	UG/L	
MW-17-2	05/17/05	Potassium	12300	UG/L	
MW-2	02/01/05	Potassium	4530	UG/L	J, B, E
MW-2	02/01/05	Potassium	4780	UG/L	J, B, E
MW-2	02/01/05	Potassium	4530	UG/L	J, B, E
MW-2	02/01/05	Potassium	4810	UG/L	J, B, E
MW-20-2	02/09/05	Potassium	6340	UG/L	J, E
MW-20-2	02/09/05	Potassium	5500	UG/L	
MW-5-2	02/01/05	Potassium	5670	UG/L	J, E
MW-5-2	02/01/05	Potassium	5310	UG/L	J, E
MW-5-2	02/01/05	Potassium	5110	UG/L	J, E
MW-5-2	02/01/05	Potassium	5530	UG/L	J, E
MW-6	02/09/05	Potassium	3960	UG/L	B
MW-6	02/09/05	Potassium	3910	UG/L	J, B, E
MW-7-2	02/09/05	Potassium	12300	UG/L	J, E
MW-7-2	02/09/05	Potassium	9700	UG/L	
MW-9-2	05/18/05	Potassium	4440	UG/L	B
MW-9-2	05/18/05	Potassium	4560	UG/L	B
TF-CH	02/08/05	Potassium	2740	UG/L	J, B, E
TF-CH	02/08/05	Potassium	2680	UG/L	B
ICPP-2019	04/19/05	Potassium	3670	UG/L	B
ICPP-2019	04/19/05	Potassium	3700	UG/L	B
ICPP-2019	04/19/05	Potassium	3780	UG/L	B
ICPP-2018	04/19/05	Potassium	5230	UG/L	
ICPP-2018	04/19/05	Potassium	5080	UG/L	
ICPP-2018	04/19/05	Potassium	5210	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
ICPP-2018	05/09/05	Potassium	5160	UG/L	
ICPP-2018	05/09/05	Potassium	5240	UG/L	
USGS-050	02/16/05	Potassium	5290	UG/L	
USGS-050	02/16/05	Potassium	5270	UG/L	
33-1	05/11/05	Selenium	4.6	UG/L	B
33-1	05/11/05	Selenium	5.1	UG/L	B
33-2	02/15/05	Selenium	8	UG/L	U, B
33-2	02/15/05	Selenium	7.8	UG/L	U, B
33-3	02/09/05	Selenium	0.64	UG/L	U
33-3	02/09/05	Selenium	8.6	UG/L	U, B
33-4-1	02/21/05	Selenium	7	UG/L	U, B
33-4-1	02/21/05	Selenium	8.4	UG/L	U, B
37-4	02/21/05	Selenium	8.2	UG/L	U, B
37-4	02/21/05	Selenium	8.3	UG/L	U, B
55-06	02/01/05	Selenium	2.6	UG/L	U, B
55-06	02/01/05	Selenium	1.9	UG/L	U, B
BLR-CH	02/08/05	Selenium	8.6	UG/L	U, B
BLR-DP	03/02/05	Selenium	10.9	UG/L	U, B
BLR-DP	03/02/05	Selenium	10.5	UG/L	U, B
CS-CH	02/22/05	Selenium	11	UG/L	U, B
CS-CH	02/22/05	Selenium	7.3	UG/L	U, B
MW-10-2	02/02/05	Selenium	2.1	UG/L	U, B
MW-10-2	02/03/05	Selenium	6	UG/L	U, B
MW-1-4	05/18/05	Selenium	2.5	UG/L	U
MW-1-4	05/18/05	Selenium	2.5	UG/L	U
MW-15	10/11/04	Selenium	5.9	UG/L	UJ, B
MW-15	10/11/04	Selenium	6.4	UG/L	UJ, B
MW-17-2	05/17/05	Selenium	2.5	UG/L	U
MW-17-2	05/17/05	Selenium	2.5	UG/L	U
MW-2	02/01/05	Selenium	2.5	UG/L	U, B
MW-2	02/01/05	Selenium	1.6	UG/L	U, B
MW-2	02/01/05	Selenium	1.9	UG/L	U, B
MW-2	02/01/05	Selenium	1.3	UG/L	U, B
MW-20-2	02/09/05	Selenium	2.3	UG/L	U, B
MW-20-2	02/09/05	Selenium	5.6	UG/L	U, B
MW-5-2	02/01/05	Selenium	0.64	UG/L	U
MW-5-2	02/01/05	Selenium	1.6	UG/L	U, B
MW-5-2	02/01/05	Selenium	2.1	UG/L	U, B
MW-5-2	02/01/05	Selenium	2.2	UG/L	U, B
MW-6	02/09/05	Selenium	6.5	UG/L	U, B
MW-6	02/09/05	Selenium	2.5	UG/L	U, B
MW-7-2	02/09/05	Selenium	3.1	UG/L	U, B
MW-7-2	02/09/05	Selenium	7.2	UG/L	U, B
MW-9-2	05/18/05	Selenium	4	UG/L	B
MW-9-2	05/18/05	Selenium	2.5	UG/L	U
TF-CH	02/08/05	Selenium	3	UG/L	U
TF-CH	02/08/05	Selenium	8.1	UG/L	U
ICPP-2019	04/19/05	Selenium	6	UG/L	U
ICPP-2019	04/19/05	Selenium	6.3	UG/L	B
ICPP-2019	05/03/05	Selenium	10	UG/L	U
ICPP-2018	04/19/05	Selenium	6	UG/L	U
ICPP-2018	04/19/05	Selenium	6.5	UG/L	B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
ICPP-2018	05/03/05	Selenium	10	UG/L	U
ICPP-2018	05/09/05	Selenium	10	UG/L	U
ICPP-2018	05/09/05	Selenium	5	UG/L	U
ICPP-2018	05/09/05	Selenium	5	UG/L	U
USGS-050	02/16/05	Selenium	6	UG/L	U, B
USGS-050	02/16/05	Selenium	5.3	UG/L	U, B
ICPP-2019	04/19/05	Silica	22700	UG/L	
ICPP-2019	04/19/05	Silica	23600	UG/L	
ICPP-2018	04/19/05	Silica	29300	UG/L	
ICPP-2018	04/19/05	Silica	30300	UG/L	
ICPP-2018	05/09/05	Silicon	14800	UG/L	
ICPP-2018	05/09/05	Silicon	14800	UG/L	
33-1	05/11/05	Silver	1.6	UG/L	B
33-1	05/11/05	Silver	0.2	UG/L	U
33-2	02/15/05	Silver	0.04	UG/L	U
33-2	02/15/05	Silver	0.11	UG/L	B
33-3	02/09/05	Silver	6.5	UG/L	
33-3	02/09/05	Silver	0.04	UG/L	U
33-4-1	02/21/05	Silver	0.04	UG/L	U
33-4-1	02/21/05	Silver	0.04	UG/L	U
37-4	02/21/05	Silver	0.04	UG/L	U
37-4	02/21/05	Silver	0.093	UG/L	B
55-06	02/01/05	Silver	0.04	UG/L	U
55-06	02/01/05	Silver	0.69	UG/L	B
BLR-CH	02/08/05	Silver	0.04	UG/L	U
BLR-DP	03/02/05	Silver	0.24	UG/L	B
BLR-DP	03/02/05	Silver	0.04	UG/L	U
CS-CH	02/22/05	Silver	0.04	UG/L	U
CS-CH	02/22/05	Silver	1	UG/L	B
MW-10-2	02/02/05	Silver	0.12	UG/L	B
MW-10-2	02/03/05	Silver	0.04	UG/L	U
MW-1-4	05/18/05	Silver	0.2	UG/L	U
MW-1-4	05/18/05	Silver	0.2	UG/L	U
MW-15	10/11/04	Silver	0.835	UG/L	UJ
MW-15	10/11/04	Silver	0.835	UG/L	UJ
MW-17-2	05/17/05	Silver	0.2	UG/L	U
MW-17-2	05/17/05	Silver	0.2	UG/L	U
MW-2	02/01/05	Silver	0.04	UG/L	U
MW-2	02/01/05	Silver	0.04	UG/L	U
MW-2	02/01/05	Silver	0.04	UG/L	U
MW-2	02/01/05	Silver	0.04	UG/L	U
MW-20-2	02/09/05	Silver	0.06	UG/L	B
MW-20-2	02/09/05	Silver	0.04	UG/L	U
MW-5-2	02/01/05	Silver	0.04	UG/L	U
MW-5-2	02/01/05	Silver	0.04	UG/L	U
MW-5-2	02/01/05	Silver	0.04	UG/L	U
MW-5-2	02/01/05	Silver	0.04	UG/L	U
MW-6	02/09/05	Silver	0.04	UG/L	U
MW-6	02/09/05	Silver	0.049	UG/L	B
MW-7-2	02/09/05	Silver	0.12	UG/L	B
MW-7-2	02/09/05	Silver	0.04	UG/L	U
MW-9-2	05/18/05	Silver	0.2	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-9-2	05/18/05	Silver	0.2	UG/L	U
TF-CH	02/08/05	Silver	0.04	UG/L	U
TF-CH	02/08/05	Silver	0.04	UG/L	U
ICPP-2019	04/19/05	Silver	1	UG/L	U
ICPP-2019	04/19/05	Silver	1	UG/L	U
ICPP-2019	05/03/05	Silver	5	UG/L	U
ICPP-2018	04/19/05	Silver	1	UG/L	U
ICPP-2018	04/19/05	Silver	1	UG/L	U
ICPP-2018	05/03/05	Silver	5	UG/L	U
ICPP-2018	05/09/05	Silver	5	UG/L	U
ICPP-2018	05/09/05	Silver	0.25	UG/L	U
ICPP-2018	05/09/05	Silver	0.25	UG/L	U
USGS-050	02/16/05	Silver	0.04	UG/L	U
USGS-050	02/16/05	Silver	0.14	UG/L	B
33-1	05/11/05	Sodium	65200	UG/L	J, E
33-1	05/11/05	Sodium	70600	UG/L	J, E
33-2	02/15/05	Sodium	50800	UG/L	
33-2	02/15/05	Sodium	52600	UG/L	
33-3	02/09/05	Sodium	14100	UG/L	
33-3	02/09/05	Sodium	959	UG/L	B
33-4-1	02/21/05	Sodium	12900	UG/L	
33-4-1	02/21/05	Sodium	12900	UG/L	
37-4	02/21/05	Sodium	36100	UG/L	
37-4	02/21/05	Sodium	42300	UG/L	
55-06	02/01/05	Sodium	33500	UG/L	
55-06	02/01/05	Sodium	33300	UG/L	
BLR-CH	02/08/05	Sodium	11700	UG/L	
BLR-DP	03/02/05	Sodium	28200	UG/L	
BLR-DP	03/02/05	Sodium	28800	UG/L	
CS-CH	02/22/05	Sodium	26200	UG/L	
CS-CH	02/22/05	Sodium	34700	UG/L	
MW-10-2	02/02/05	Sodium	40700	UG/L	
MW-10-2	02/03/05	Sodium	45800	UG/L	
MW-1-4	05/18/05	Sodium	30900	UG/L	J, E
MW-1-4	05/18/05	Sodium	29600	UG/L	J, E
MW-15	10/11/04	Sodium	13800	UG/L	J
MW-15	10/11/04	Sodium	14400	UG/L	J
MW-17-2	05/17/05	Sodium	99300	UG/L	J, E
MW-17-2	05/17/05	Sodium	102000	UG/L	J, E
MW-2	02/01/05	Sodium	42700	UG/L	
MW-2	02/01/05	Sodium	44500	UG/L	
MW-2	02/01/05	Sodium	43800	UG/L	
MW-2	02/01/05	Sodium	43200	UG/L	
MW-20-2	02/09/05	Sodium	22100	UG/L	
MW-20-2	02/09/05	Sodium	24600	UG/L	
MW-5-2	02/01/05	Sodium	41600	UG/L	
MW-5-2	02/01/05	Sodium	38200	UG/L	
MW-5-2	02/01/05	Sodium	37600	UG/L	
MW-5-2	02/01/05	Sodium	37900	UG/L	
MW-6	02/09/05	Sodium	35600	UG/L	
MW-6	02/09/05	Sodium	30700	UG/L	
MW-7-2	02/09/05	Sodium	67400	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-7-2	02/09/05	Sodium	69800	UG/L	
MW-9-2	05/18/05	Sodium	47200	UG/L	J, E
MW-9-2	05/18/05	Sodium	47600	UG/L	J, E
TF-CH	02/08/05	Sodium	14100	UG/L	
TF-CH	02/08/05	Sodium	14800	UG/L	
ICPP-2019	04/19/05	Sodium	41200	UG/L	
ICPP-2019	04/19/05	Sodium	43100	UG/L	
ICPP-2019	04/19/05	Sodium	44000	UG/L	
ICPP-2018	04/19/05	Sodium	45000	UG/L	
ICPP-2018	04/19/05	Sodium	45200	UG/L	
ICPP-2018	04/19/05	Sodium	46000	UG/L	
ICPP-2018	05/09/05	Sodium	41500	UG/L	J, E
ICPP-2018	05/09/05	Sodium	42300	UG/L	J, E
USGS-050	02/16/05	Sodium	64000	UG/L	
USGS-050	02/16/05	Sodium	66300	UG/L	
33-1	05/11/05	Solids, Total Dissolved	447	MG/L	J, H
33-2	02/15/05	Solids, Total Dissolved	357	MG/L	
33-3	02/09/05	Solids, Total Dissolved	2200	MG/L	
33-4-1	02/21/05	Solids, Total Dissolved	268	MG/L	
37-4	02/21/05	Solids, Total Dissolved	507	MG/L	
55-06	02/01/05	Solids, Total Dissolved	340	MG/L	
BLR-CH	02/08/05	Solids, Total Dissolved	183	MG/L	
BLR-DP	03/02/05	Solids, Total Dissolved	607	MG/L	
CS-CH	02/22/05	Solids, Total Dissolved	395	MG/L	
MW-10-2	02/02/05	Solids, Total Dissolved	514	MG/L	
MW-1-4	05/18/05	Solids, Total Dissolved	581	MG/L	
MW-15	10/11/04	Solids, Total Dissolved	253	MG/L	J, H
MW-15	10/11/04	Solids, Total Dissolved	254	MG/L	J, H
MW-17-2	05/17/05	Solids, Total Dissolved	267	MG/L	
MW-2	02/01/05	Solids, Total Dissolved	366	MG/L	
MW-2	02/01/05	Solids, Total Dissolved	368	MG/L	
MW-20-2	02/09/05	Solids, Total Dissolved	327	MG/L	
MW-5-2	02/01/05	Solids, Total Dissolved	520	MG/L	
MW-5-2	02/01/05	Solids, Total Dissolved	519	MG/L	
MW-6	02/09/05	Solids, Total Dissolved	407	MG/L	
MW-9-2	05/18/05	Solids, Total Dissolved	313	MG/L	
TF-CH	02/08/05	Solids, Total Dissolved	355	MG/L	
ICPP-2019	04/19/05	Solids, Total Dissolved	332	MG/L	
ICPP-2018	04/19/05	Solids, Total Dissolved	482	MG/L	
USGS-050	02/16/05	Solids, Total Dissolved	458	MG/L	
ICPP-2019	04/19/05	Strontium	331	UG/L	
ICPP-2019	04/19/05	Strontium	335	UG/L	
ICPP-2018	04/19/05	Strontium	467	UG/L	
ICPP-2018	04/19/05	Strontium	471	UG/L	
ICPP-2018	05/09/05	Strontium	498	UG/L	
ICPP-2018	05/09/05	Strontium	499	UG/L	
33-1	05/11/05	Sulfate	60.8	MG/L	J
33-2	02/15/05	Sulfate	38.1	MG/L	
33-3	02/09/05	Sulfate	100	MG/L	J
33-4-1	02/21/05	Sulfate	28.6	MG/L	
33-4-1	02/21/05	Sulfate	28.6	MG/L	
37-4	02/21/05	Sulfate	65.4	MG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
37-4	02/21/05	Sulfate	65.4	MG/L	
55-06	02/01/05	Sulfate	25	MG/L	
BLR-CH	02/08/05	Sulfate	26.2	MG/L	J
BLR-DP	03/02/05	Sulfate	38	MG/L	J
CS-CH	02/22/05	Sulfate	51.8	MG/L	
CS-CH	02/22/05	Sulfate	51.8	MG/L	
MW-10-2	02/02/05	Sulfate	40.7	MG/L	
MW-1-4	05/18/05	Sulfate	25.8	MG/L	J
MW-15	10/11/04	Sulfate	23.8	MG/L	J
MW-15	10/11/04	Sulfate	23.9	MG/L	J
MW-17-2	05/17/05	Sulfate	60.4	MG/L	J
MW-2	02/01/05	Sulfate	28.7	MG/L	
MW-2	02/01/05	Sulfate	28.7	MG/L	
MW-20-2	02/09/05	Sulfate	36.7	MG/L	J
MW-5-2	02/01/05	Sulfate	26.5	MG/L	
MW-5-2	02/01/05	Sulfate	26.7	MG/L	
MW-6	02/09/05	Sulfate	32.6	MG/L	J
MW-7-2	02/09/05	Sulfate	35.5	MG/L	J
MW-9-2	05/18/05	Sulfate	29.8	MG/L	J
TF-CH	02/08/05	Sulfate	39.9	MG/L	J
ICPP-2019	04/19/05	Sulfate	29	MG/L	
ICPP-2018	04/19/05	Sulfate	33.9	MG/L	
USGS-050	02/16/05	Sulfate	39.9	MG/L	
ICPP-2018	05/09/05	Sulfide	1	MG/L	UJ
ICPP-2018	05/09/05	Sulfide	1	MG/L	UJ
33-1	05/11/05	Thallium	0.48	UG/L	B
33-1	05/11/05	Thallium	0.4	UG/L	U
33-2	02/15/05	Thallium	0.02	UG/L	U
33-2	02/15/05	Thallium	0.02	UG/L	U
33-3	02/09/05	Thallium	0.49	UG/L	B
33-3	02/09/05	Thallium	0.035	UG/L	U, B
33-4-1	02/21/05	Thallium	0.063	UG/L	U, B
33-4-1	02/21/05	Thallium	0.034	UG/L	U, B
37-4	02/21/05	Thallium	0.12	UG/L	U, B
37-4	02/21/05	Thallium	0.06	UG/L	U, B
55-06	02/01/05	Thallium	0.02	UG/L	U
55-06	02/01/05	Thallium	0.02	UG/L	U, B
BLR-CH	02/08/05	Thallium	0.14	UG/L	U, B
BLR-DP	03/02/05	Thallium	0.1	UG/L	U, B
BLR-DP	03/02/05	Thallium	0.068	UG/L	U, B
CS-CH	02/22/05	Thallium	0.03	UG/L	U, B
CS-CH	02/22/05	Thallium	0.52	UG/L	B
MW-10-2	02/02/05	Thallium	0.35	UG/L	B
MW-10-2	02/03/05	Thallium	0.048	UG/L	U, B
MW-1-4	05/18/05	Thallium	0.4	UG/L	U
MW-1-4	05/18/05	Thallium	0.4	UG/L	U
MW-15	10/11/04	Thallium	10	UG/L	UJ
MW-15	10/11/04	Thallium	10	UG/L	UJ
MW-17-2	05/17/05	Thallium	0.4	UG/L	U
MW-17-2	05/17/05	Thallium	0.4	UG/L	U
MW-2	02/01/05	Thallium	0.02	UG/L	U
MW-2	02/01/05	Thallium	0.023	UG/L	U, B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-2	02/01/05	Thallium	0.02	UG/L	U
MW-2	02/01/05	Thallium	0.02	UG/L	U
MW-20-2	02/09/05	Thallium	0.08	UG/L	U
MW-20-2	02/09/05	Thallium	0.02	UG/L	U
MW-5-2	02/01/05	Thallium	0.029	UG/L	U, B
MW-5-2	02/01/05	Thallium	0.084	UG/L	U, B
MW-5-2	02/01/05	Thallium	0.044	UG/L	U, B
MW-5-2	02/01/05	Thallium	0.14	UG/L	U, B
MW-6	02/09/05	Thallium	0.57	UG/L	B
MW-6	02/09/05	Thallium	0.37	UG/L	B
MW-7-2	02/09/05	Thallium	0.18	UG/L	B
MW-7-2	02/09/05	Thallium	0.02	UG/L	U
MW-9-2	05/18/05	Thallium	0.4	UG/L	U
MW-9-2	05/18/05	Thallium	0.4	UG/L	U
TF-CH	02/08/05	Thallium	0.02	UG/L	U
TF-CH	02/08/05	Thallium	0.065	UG/L	U
ICPP-2019	04/19/05	Thallium	5	UG/L	U
ICPP-2019	04/19/05	Thallium	5	UG/L	U
ICPP-2018	04/19/05	Thallium	5	UG/L	U
ICPP-2018	04/19/05	Thallium	5	UG/L	U
ICPP-2018	05/09/05	Thallium	10	UG/L	U
ICPP-2018	05/09/05	Thallium	10	UG/L	U
USGS-050	02/16/05	Thallium	0.02	UG/L	U
USGS-050	02/16/05	Thallium	0.058	UG/L	U, B
ICPP-2019	04/19/05	Tin	2.5	UG/L	U
ICPP-2019	04/19/05	Tin	2.5	UG/L	U
ICPP-2018	04/19/05	Tin	2.5	UG/L	U
ICPP-2018	04/19/05	Tin	2.5	UG/L	U
ICPP-2018	05/09/05	Tin	5	UG/L	U
ICPP-2018	05/09/05	Tin	5	UG/L	U
ICPP-2019	04/19/05	Titanium	1	UG/L	U
ICPP-2019	04/19/05	Titanium	3.7	UG/L	U, B
ICPP-2018	04/19/05	Titanium	1	UG/L	U
ICPP-2018	04/19/05	Titanium	1	UG/L	U
ICPP-2018	05/09/05	Titanium	4	UG/L	U
ICPP-2018	05/09/05	Titanium	4	UG/L	U
33-1	05/11/05	Uranium	6.4	UG/L	B
33-1	05/11/05	Uranium	5.9	UG/L	B
33-2	02/15/05	Uranium	2.1	UG/L	B
33-2	02/15/05	Uranium	3.4	UG/L	B
33-3	02/09/05	Uranium	18.5	UG/L	B
33-3	02/09/05	Uranium	4.3	UG/L	B
33-4-1	02/21/05	Uranium	2.7	UG/L	B
33-4-1	02/21/05	Uranium	2.7	UG/L	B
37-4	02/21/05	Uranium	6.3	UG/L	B
37-4	02/21/05	Uranium	6.5	UG/L	B
55-06	02/01/05	Uranium	3.6	UG/L	B
55-06	02/01/05	Uranium	4.3	UG/L	B
BLR-CH	02/08/05	Uranium	2.4	UG/L	B
BLR-DP	03/02/05	Uranium	4.7	UG/L	B
BLR-DP	03/02/05	Uranium	3.7	UG/L	B
CS-CH	02/22/05	Uranium	2.8	UG/L	B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
CS-CH	02/22/05	Uranium	11	UG/L	B
MW-10-2	02/02/05	Uranium	6.4	UG/L	B
MW-10-2	02/03/05	Uranium	6.2	UG/L	B
MW-1-4	05/18/05	Uranium	3.1	UG/L	B
MW-1-4	05/18/05	Uranium	3.1	UG/L	B
MW-15	10/11/04	Uranium	3.2	UG/L	J, B
MW-15	10/11/04	Uranium	3.1	UG/L	J, B
MW-17-2	05/17/05	Uranium	4.8	UG/L	B
MW-17-2	05/17/05	Uranium	1.1	UG/L	B
MW-2	02/01/05	Uranium	3.4	UG/L	B
MW-2	02/01/05	Uranium	3.4	UG/L	B
MW-2	02/01/05	Uranium	3.4	UG/L	B
MW-2	02/01/05	Uranium	3.5	UG/L	B
MW-20-2	02/09/05	Uranium	5.5	UG/L	B
MW-20-2	02/09/05	Uranium	5.4	UG/L	B
MW-5-2	02/01/05	Uranium	3.9	UG/L	B
MW-5-2	02/01/05	Uranium	4	UG/L	B
MW-5-2	02/01/05	Uranium	3.8	UG/L	B
MW-5-2	02/01/05	Uranium	4	UG/L	B
MW-6	02/09/05	Uranium	4	UG/L	B
MW-6	02/09/05	Uranium	3.9	UG/L	B
MW-7-2	02/09/05	Uranium	5.1	UG/L	B
MW-7-2	02/09/05	Uranium	3.9	UG/L	B
MW-9-2	05/18/05	Uranium	2.7	UG/L	B
MW-9-2	05/18/05	Uranium	2.8	UG/L	B
TF-CH	02/08/05	Uranium	4.7	UG/L	B
TF-CH	02/08/05	Uranium	4.9	UG/L	B
ICPP-2019	04/19/05	Uranium	4.1	UG/L	B
ICPP-2019	04/19/05	Uranium	4.1	UG/L	B
ICPP-2018	04/19/05	Uranium	3.5	UG/L	B
ICPP-2018	04/19/05	Uranium	3.6	UG/L	B
ICPP-2018	05/09/05	Uranium	100	UG/L	U
ICPP-2018	05/09/05	Uranium	100	UG/L	U
USGS-050	02/16/05	Uranium	7.7	UG/L	B
USGS-050	02/16/05	Uranium	7.8	UG/L	B
33-1	05/11/05	Vanadium	5.6	UG/L	B
33-1	05/11/05	Vanadium	2	UG/L	U
33-2	02/15/05	Vanadium	9.1	UG/L	B
33-2	02/15/05	Vanadium	279	UG/L	
33-3	02/09/05	Vanadium	1210	UG/L	
33-3	02/09/05	Vanadium	5.44	UG/L	U
33-4-1	02/21/05	Vanadium	5.44	UG/L	U
33-4-1	02/21/05	Vanadium	5.44	UG/L	U
37-4	02/21/05	Vanadium	7	UG/L	B
37-4	02/21/05	Vanadium	7.9	UG/L	B
55-06	02/01/05	Vanadium	5.44	UG/L	U
55-06	02/01/05	Vanadium	6.8	UG/L	B
BLR-CH	02/08/05	Vanadium	5.44	UG/L	U
BLR-DP	03/02/05	Vanadium	23.2	UG/L	B
BLR-DP	03/02/05	Vanadium	5.44	UG/L	U
CS-CH	02/22/05	Vanadium	5.44	UG/L	U
CS-CH	02/22/05	Vanadium	535	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
MW-10-2	02/02/05	Vanadium	22.5	UG/L	B
MW-10-2	02/03/05	Vanadium	5.5	UG/L	B
MW-1-4	05/18/05	Vanadium	2	UG/L	U
MW-1-4	05/18/05	Vanadium	2	UG/L	U
MW-15	10/11/04	Vanadium	3.7	UG/L	J, B
MW-15	10/11/04	Vanadium	3.7	UG/L	J, B
MW-17-2	05/17/05	Vanadium	18.9	UG/L	B
MW-17-2	05/17/05	Vanadium	3	UG/L	B
MW-2	02/01/05	Vanadium	5.44	UG/L	U
MW-2	02/01/05	Vanadium	5.44	UG/L	U
MW-2	02/01/05	Vanadium	5.6	UG/L	B
MW-2	02/01/05	Vanadium	5.44	UG/L	U
MW-20-2	02/09/05	Vanadium	12.8	UG/L	B
MW-20-2	02/09/05	Vanadium	5.44	UG/L	U
MW-5-2	02/01/05	Vanadium	5.44	UG/L	U
MW-5-2	02/01/05	Vanadium	5.44	UG/L	U
MW-5-2	02/01/05	Vanadium	5.44	UG/L	U
MW-5-2	02/01/05	Vanadium	5.44	UG/L	U
MW-6	02/09/05	Vanadium	5.44	UG/L	U
MW-6	02/09/05	Vanadium	5.44	UG/L	U
MW-7-2	02/09/05	Vanadium	5.44	UG/L	U
MW-7-2	02/09/05	Vanadium	5.44	UG/L	U
MW-9-2	05/18/05	Vanadium	8.3	UG/L	B
MW-9-2	05/18/05	Vanadium	8.6	UG/L	B
TF-CH	02/08/05	Vanadium	5.44	UG/L	U
TF-CH	02/08/05	Vanadium	5.44	UG/L	U
ICPP-2019	04/19/05	Vanadium	4.5	UG/L	U, B
ICPP-2019	04/19/05	Vanadium	5.7	UG/L	U, B
ICPP-2019	05/03/05	Vanadium	5	UG/L	U
ICPP-2018	04/19/05	Vanadium	1	UG/L	U, B
ICPP-2018	04/19/05	Vanadium	2.1	UG/L	U, B
ICPP-2018	05/03/05	Vanadium	5	UG/L	U
ICPP-2018	05/09/05	Vanadium	5	UG/L	U
ICPP-2018	05/09/05	Vanadium	5	UG/L	U
ICPP-2018	05/09/05	Vanadium	5	UG/L	U
USGS-050	02/16/05	Vanadium	8.3	UG/L	B
USGS-050	02/16/05	Vanadium	26.6	UG/L	B
33-1	05/11/05	Zinc	23.7	UG/L	
33-1	05/11/05	Zinc	3.5	UG/L	U, B
33-2	02/15/05	Zinc	3.2	UG/L	B
33-2	02/15/05	Zinc	74.4	UG/L	
33-3	02/09/05	Zinc	1090	UG/L	
33-3	02/09/05	Zinc	7.1	UG/L	B
33-4-1	02/21/05	Zinc	8.6	UG/L	B
33-4-1	02/21/05	Zinc	6.9	UG/L	U, B
37-4	02/21/05	Zinc	66.3	UG/L	
37-4	02/21/05	Zinc	12.4	UG/L	B
55-06	02/01/05	Zinc	6.6	UG/L	U, B
55-06	02/01/05	Zinc	22.6	UG/L	U
BLR-CH	02/08/05	Zinc	4.4	UG/L	B
BLR-DP	03/02/05	Zinc	341	UG/L	
BLR-DP	03/02/05	Zinc	92.5	UG/L	

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
CS-CH	02/22/05	Zinc	110	UG/L	
CS-CH	02/22/05	Zinc	22000	UG/L	
MW-10-2	02/02/05	Zinc	42.7	UG/L	U, B
MW-10-2	02/03/05	Zinc	12	UG/L	B
MW-1-4	05/18/05	Zinc	17.5	UG/L	B
MW-1-4	05/18/05	Zinc	35	UG/L	
MW-15	10/11/04	Zinc	12.9	UG/L	UJ, B
MW-15	10/11/04	Zinc	14.1	UG/L	UJ, B
MW-17-2	05/17/05	Zinc	192	UG/L	
MW-17-2	05/17/05	Zinc	5.7	UG/L	U, B
MW-2	02/01/05	Zinc	3.4	UG/L	U, B
MW-2	02/01/05	Zinc	3.8	UG/L	U, B
MW-2	02/01/05	Zinc	4.5	UG/L	U, B
MW-2	02/01/05	Zinc	5.7	UG/L	U, B
MW-20-2	02/09/05	Zinc	23.3	UG/L	
MW-20-2	02/09/05	Zinc	6.9	UG/L	B
MW-5-2	02/01/05	Zinc	6.5	UG/L	U, B
MW-5-2	02/01/05	Zinc	4.7	UG/L	U, B
MW-5-2	02/01/05	Zinc	4.8	UG/L	U, B
MW-5-2	02/01/05	Zinc	6.9	UG/L	U, B
MW-6	02/09/05	Zinc	6	UG/L	B
MW-6	02/09/05	Zinc	5.9	UG/L	B
MW-7-2	02/09/05	Zinc	68.1	UG/L	
MW-7-2	02/09/05	Zinc	5.4	UG/L	B
MW-9-2	05/18/05	Zinc	4.3	UG/L	U, B
MW-9-2	05/18/05	Zinc	19.9	UG/L	B
TF-CH	02/08/05	Zinc	11.3	UG/L	B
TF-CH	02/08/05	Zinc	6.7	UG/L	B
ICPP-2019	04/19/05	Zinc	2	UG/L	U
ICPP-2019	04/19/05	Zinc	135	UG/L	
ICPP-2018	04/19/05	Zinc	2	UG/L	U
ICPP-2018	04/19/05	Zinc	2	UG/L	U
ICPP-2018	05/09/05	Zinc	5	UG/L	U
ICPP-2018	05/09/05	Zinc	5	UG/L	U
USGS-050	02/16/05	Zinc	6.5	UG/L	B
USGS-050	02/16/05	Zinc	82.2	UG/L	
33-1	05/11/05	Zirconium	7.5	UG/L	
33-1	05/11/05	Zirconium	0.5	UG/L	U
33-2	02/15/05	Zirconium	0.216	UG/L	U
33-2	02/15/05	Zirconium	1.2	UG/L	U
33-3	02/09/05	Zirconium	41.7	UG/L	N
33-3	02/09/05	Zirconium	0.216	UG/L	U
33-4-1	02/21/05	Zirconium	0.216	UG/L	U
33-4-1	02/21/05	Zirconium	0.29	UG/L	B
37-4	02/21/05	Zirconium	0.216	UG/L	U
37-4	02/21/05	Zirconium	0.87	UG/L	B
55-06	02/01/05	Zirconium	0.216	UG/L	UJ, N
55-06	02/01/05	Zirconium	2.7	UG/L	J, N
BLR-CH	02/08/05	Zirconium	0.216	UG/L	U
BLR-DP	03/02/05	Zirconium	5	UG/L	
BLR-DP	03/02/05	Zirconium	0.37	UG/L	B
CS-CH	02/22/05	Zirconium	0.216	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
CS-CH	02/22/05	Zirconium	56.5	UG/L	
MW-10-2	02/02/05	Zirconium	9.1	UG/L	J, N
MW-10-2	02/03/05	Zirconium	0.216	UG/L	U
MW-1-4	05/18/05	Zirconium	0.5	UG/L	U
MW-1-4	05/18/05	Zirconium	3.3	UG/L	U
MW-17-2	05/17/05	Zirconium	5.7	UG/L	
MW-17-2	05/17/05	Zirconium	0.5	UG/L	U
MW-2	02/01/05	Zirconium	0.216	UG/L	UJ
MW-2	02/01/05	Zirconium	0.216	UG/L	UJ
MW-2	02/01/05	Zirconium	0.216	UG/L	UJ
MW-2	02/01/05	Zirconium	0.216	UG/L	UJ
MW-20-2	02/09/05	Zirconium	6.7	UG/L	N
MW-20-2	02/09/05	Zirconium	0.51	UG/L	U, B
MW-5-2	02/01/05	Zirconium	0.55	UG/L	UJ, BN
MW-5-2	02/01/05	Zirconium	0.46	UG/L	UJ, BN
MW-5-2	02/01/05	Zirconium	0.39	UG/L	UJ, BN
MW-5-2	02/01/05	Zirconium	0.42	UG/L	UJ, BN
MW-6	02/09/05	Zirconium	0.45	UG/L	U, B
MW-6	02/09/05	Zirconium	0.94	UG/L	BN
MW-7-2	02/09/05	Zirconium	5.7	UG/L	N
MW-7-2	02/09/05	Zirconium	0.216	UG/L	U
MW-9-2	05/18/05	Zirconium	0.5	UG/L	U
MW-9-2	05/18/05	Zirconium	0.5	UG/L	U
TF-CH	02/08/05	Zirconium	1.2	UG/L	N
TF-CH	02/08/05	Zirconium	0.216	UG/L	U
USGS-050	02/16/05	Zirconium	0.216	UG/L	U
USGS-050	02/16/05	Zirconium	3.3	UG/L	U
Suction Lysimeters					
A-65-36	05/23/05	Aluminum	10.8	UG/L	U, B
BLR-DP-L352	03/01/05	Aluminum	9.08	UG/L	U
BLR-SP-L167	05/23/05	Aluminum	6.4	UG/L	U, B
TF-AL-L35	05/23/05	Aluminum	5	UG/L	U
TF-SP-L118	03/01/05	Aluminum	9.08	UG/L	U
A-65-36	05/23/05	Antimony	0.5	UG/L	U
BLR-DP-L352	03/01/05	Antimony	0.39	UG/L	B
BLR-SP-L167	05/23/05	Antimony	6	UG/L	B
TF-AL-L35	05/23/05	Antimony	0.57	UG/L	B
TF-SP-L118	03/01/05	Antimony	3.7	UG/L	B
A-65-36	05/23/05	Arsenic	1.5	UG/L	U
BLR-DP-L352	03/01/05	Arsenic	7	UG/L	U, B
BLR-SP-L167	05/23/05	Arsenic	6.1	UG/L	B
TF-AL-L35	05/23/05	Arsenic	1.5	UG/L	U
TF-SP-L118	03/01/05	Arsenic	10	UG/L	U
A-65-36	05/23/05	Barium	116	UG/L	
BLR-DP-L352	03/01/05	Barium	26	UG/L	B
BLR-SP-L167	05/23/05	Barium	78.7	UG/L	B
TF-AL-L35	05/23/05	Barium	27.2	UG/L	B
TF-SP-L118	03/01/05	Barium	20.1	UG/L	B
A-65-36	05/23/05	Beryllium	0.1	UG/L	U
BLR-DP-L352	03/01/05	Beryllium	0.08	UG/L	U
BLR-SP-L167	05/23/05	Beryllium	0.1	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
TF-AL-L35	05/23/05	Beryllium	0.1	UG/L	U
TF-SP-L118	03/01/05	Beryllium	0.08	UG/L	U
A-65-36	05/23/05	Boron	43.6	UG/L	
BLR-DP-L352	03/01/05	Boron	37.1	UG/L	
BLR-SP-L167	05/23/05	Boron	353	UG/L	
TF-AL-L35	05/23/05	Boron	267	UG/L	
TF-SP-L118	03/01/05	Boron	776	UG/L	
A-60-39	03/01/05	Bromide	0.32	MG/L	J
A-63-45	03/01/05	Bromide	0.331	MG/L	J
A-65-36	03/01/05	Bromide	0.916	MG/L	
BLR-AL-L32	03/01/05	Bromide	0.302	MG/L	J
BLR-DP-L352	03/01/05	Bromide	0	MG/L	U
BLR-SP-L167	03/01/05	Bromide	0	MG/L	U
CS-DP-L280	03/01/05	Bromide	0	MG/L	U
CS-SP-L122	03/01/05	Bromide	0	MG/L	U
PP-AL-L27	05/23/05	Bromide	0.554	MG/L	
PP-DP-L383	03/01/05	Bromide	0	MG/L	U
PP-SP-L108	03/01/05	Bromide	0	MG/L	U
PP-SP-L169	03/01/05	Bromide	0	MG/L	U
STL-AL-L26	05/23/05	Bromide	1.65	MG/L	
STL-DP-L418	03/01/05	Bromide	0	MG/L	U
STL-SP-L103	03/01/05	Bromide	0	MG/L	U
TF-AL-L35	03/01/05	Bromide	1.02	MG/L	
TF-DP-L385	03/01/05	Bromide	0	MG/L	U
TF-SP-L118	03/01/05	Bromide	0	MG/L	U
A-65-36	05/23/05	Cadmium	0.1	UG/L	U
BLR-DP-L352	03/01/05	Cadmium	0.04	UG/L	U
BLR-SP-L167	05/23/05	Cadmium	0.1	UG/L	U
TF-AL-L35	05/23/05	Cadmium	0.14	UG/L	B
TF-SP-L118	03/01/05	Cadmium	0.04	UG/L	U
A-65-36	05/23/05	Calcium	52800	UG/L	
BLR-DP-L352	03/01/05	Calcium	44300	UG/L	
BLR-SP-L167	05/23/05	Calcium	71700	UG/L	
TF-AL-L35	05/23/05	Calcium	215000	UG/L	
TF-SP-L118	03/01/05	Calcium	121000	UG/L	
A-60-39	03/01/05	Chloride	4.92	MG/L	J
A-63-45	03/01/05	Chloride	19	MG/L	J
A-65-36	03/01/05	Chloride	3.95	MG/L	J
BLR-AL-L32	03/01/05	Chloride	54.6	MG/L	J
BLR-DP-L352	03/01/05	Chloride	10.1	MG/L	J
BLR-SP-L167	03/01/05	Chloride	11.8	MG/L	J
CS-DP-L280	03/01/05	Chloride	27.5	MG/L	J
CS-SP-L122	03/01/05	Chloride	61.9	MG/L	J
PP-AL-L27	05/23/05	Chloride	24.6	MG/L	
PP-DP-L383	03/01/05	Chloride	203	MG/L	J
PP-SP-L108	03/01/05	Chloride	140	MG/L	J
PP-SP-L169	03/01/05	Chloride	204	MG/L	J
STL-AL-L26	05/23/05	Chloride	26.8	MG/L	
STL-DP-L418	03/01/05	Chloride	13.5	MG/L	J
STL-SP-L103	03/01/05	Chloride	21.6	MG/L	J
TF-AL-L35	03/01/05	Chloride	139	MG/L	J
TF-DP-L385	03/01/05	Chloride	70.9	MG/L	J

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
TF-SP-L118	03/01/05	Chloride	55	MG/L	J
A-65-36	05/23/05	Chromium	1.8	UG/L	U, B
BLR-DP-L352	03/01/05	Chromium	2.9	UG/L	U, B
BLR-SP-L167	05/23/05	Chromium	6.7	UG/L	B
TF-AL-L35	05/23/05	Chromium	2	UG/L	U, B
TF-SP-L118	03/01/05	Chromium	1.9	UG/L	U, B
A-65-36	05/23/05	Cobalt	0.24	UG/L	B
BLR-DP-L352	03/01/05	Cobalt	0.63	UG/L	B
BLR-SP-L167	05/23/05	Cobalt	0.25	UG/L	B
TF-AL-L35	05/23/05	Cobalt	0.58	UG/L	B
TF-SP-L118	03/01/05	Cobalt	0.55	UG/L	B
A-65-36	05/23/05	Copper	0.79	UG/L	U, B
BLR-DP-L352	03/01/05	Copper	1.3	UG/L	B
BLR-SP-L167	05/23/05	Copper	3.4	UG/L	B
TF-AL-L35	05/23/05	Copper	3.1	UG/L	B
TF-SP-L118	03/01/05	Copper	9.7	UG/L	B
A-60-39	03/01/05	Fluoride	2.12	MG/L	
A-63-45	03/01/05	Fluoride	0.743	MG/L	
A-65-36	03/01/05	Fluoride	0.709	MG/L	
BLR-AL-L32	03/01/05	Fluoride	0.301	MG/L	J
BLR-DP-L352	03/01/05	Fluoride	0.268	MG/L	J
BLR-SP-L167	03/01/05	Fluoride	0.385	MG/L	J
CS-DP-L280	03/01/05	Fluoride	0.591	MG/L	
CS-SP-L122	03/01/05	Fluoride	0.238	MG/L	J
PP-AL-L27	05/23/05	Fluoride	0.475	MG/L	J
PP-DP-L383	03/01/05	Fluoride	0.37	MG/L	J
PP-SP-L108	03/01/05	Fluoride	0.997	MG/L	
PP-SP-L169	03/01/05	Fluoride	3.18	MG/L	
STL-AL-L26	05/23/05	Fluoride	0.265	MG/L	J
STL-DP-L418	03/01/05	Fluoride	2.12	MG/L	
STL-SP-L103	03/01/05	Fluoride	0.488	MG/L	J
TF-AL-L35	03/01/05	Fluoride	0.208	MG/L	J
TF-DP-L385	03/01/05	Fluoride	0.424	MG/L	J
TF-SP-L118	03/01/05	Fluoride	0.477	MG/L	J
A-65-36	05/23/05	Iron	287	UG/L	
BLR-DP-L352	03/01/05	Iron	301	UG/L	
BLR-SP-L167	05/23/05	Iron	372	UG/L	
TF-AL-L35	05/23/05	Iron	1070	UG/L	
TF-SP-L118	03/01/05	Iron	927	UG/L	
A-65-36	05/23/05	Lead	0.5	UG/L	U
BLR-DP-L352	03/01/05	Lead	0.78	UG/L	B
BLR-SP-L167	05/23/05	Lead	1.1	UG/L	B
TF-AL-L35	05/23/05	Lead	0.5	UG/L	U
TF-SP-L118	03/01/05	Lead	2	UG/L	B
A-65-36	05/23/05	Magnesium	16600	UG/L	
BLR-DP-L352	03/01/05	Magnesium	13500	UG/L	
BLR-SP-L167	05/23/05	Magnesium	21400	UG/L	
TF-AL-L35	05/23/05	Magnesium	43700	UG/L	
TF-SP-L118	03/01/05	Magnesium	33200	UG/L	
A-65-36	05/23/05	Manganese	339	UG/L	
BLR-DP-L352	03/01/05	Manganese	35.3	UG/L	
BLR-SP-L167	05/23/05	Manganese	1	UG/L	U

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
TF-AL-L35	05/23/05	Manganese	1.9	UG/L	B
TF-SP-L118	03/01/05	Manganese	7	UG/L	B
A-65-36	05/23/05	Mercury	0.05	UG/L	U
BLR-DP-L352	03/01/05	Mercury	0.0472	UG/L	U
BLR-SP-L167	05/23/05	Mercury	0.05	UG/L	U
TF-AL-L35	05/23/05	Mercury	0.05	UG/L	U
TF-SP-L118	03/01/05	Mercury	0.0472	UG/L	U
A-65-36	05/23/05	Nickel	1.4	UG/L	B
BLR-DP-L352	03/01/05	Nickel	4.2	UG/L	B
BLR-SP-L167	05/23/05	Nickel	2.3	UG/L	B
TF-AL-L35	05/23/05	Nickel	5.2	UG/L	B
TF-SP-L118	03/01/05	Nickel	7.8	UG/L	B
A-65-36	05/23/05	Potassium	2580	UG/L	B
BLR-DP-L352	03/01/05	Potassium	2000	UG/L	B
BLR-SP-L167	05/23/05	Potassium	2930	UG/L	B
TF-AL-L35	05/23/05	Potassium	7120	UG/L	
TF-SP-L118	03/01/05	Potassium	8320	UG/L	
A-65-36	05/23/05	Selenium	2.5	UG/L	U
BLR-DP-L352	03/01/05	Selenium	7.1	UG/L	U, B
BLR-SP-L167	05/23/05	Selenium	9.3	UG/L	B
TF-AL-L35	05/23/05	Selenium	20.3	UG/L	B
TF-SP-L118	03/01/05	Selenium	39.3	UG/L	U, B
A-65-36	05/23/05	Silver	0.2	UG/L	U
BLR-DP-L352	03/01/05	Silver	0.04	UG/L	U
BLR-SP-L167	05/23/05	Silver	0.2	UG/L	U
TF-AL-L35	05/23/05	Silver	0.2	UG/L	U
TF-SP-L118	03/01/05	Silver	0.04	UG/L	U
A-65-36	05/23/05	Sodium	13600	UG/L	J, E
BLR-DP-L352	03/01/05	Sodium	31700	UG/L	
BLR-SP-L167	05/23/05	Sodium	83400	UG/L	J, E
TF-AL-L35	05/23/05	Sodium	244000	UG/L	J, E
TF-SP-L118	03/01/05	Sodium	1380000	UG/L	
A-60-39	03/01/05	Sulfate	110	MG/L	J
A-63-45	03/01/05	Sulfate	87.9	MG/L	J
A-65-36	03/01/05	Sulfate	55	MG/L	J
BLR-AL-L32	03/01/05	Sulfate	527	MG/L	J
BLR-DP-L352	03/01/05	Sulfate	55.5	MG/L	J
BLR-SP-L167	03/01/05	Sulfate	18.7	MG/L	J
CS-DP-L280	03/01/05	Sulfate	640	MG/L	J
CS-SP-L122	03/01/05	Sulfate	49.6	MG/L	J
PP-AL-L27	05/23/05	Sulfate	1220	MG/L	J
PP-DP-L383	03/01/05	Sulfate	33	MG/L	J
PP-SP-L108	03/01/05	Sulfate	239	MG/L	J
PP-SP-L169	03/01/05	Sulfate	1510	MG/L	J
STL-AL-L26	05/23/05	Sulfate	179	MG/L	J
STL-DP-L418	03/01/05	Sulfate	883	MG/L	J
STL-SP-L103	03/01/05	Sulfate	717	MG/L	J
TF-AL-L35	03/01/05	Sulfate	491	MG/L	J
TF-DP-L385	03/01/05	Sulfate	35.4	MG/L	J
TF-SP-L118	03/01/05	Sulfate	2330	MG/L	J
A-65-36	05/23/05	Thallium	0.4	UG/L	U
BLR-DP-L352	03/01/05	Thallium	0.026	UG/L	U, B

Table B-4. (continued).

Location	Date Collected	Constituent	Concentration	Units	Data Qualifier Flags
BLR-SP-L167	05/23/05	Thallium	0.4	UG/L	U
TF-AL-L35	05/23/05	Thallium	0.4	UG/L	U
TF-SP-L118	03/01/05	Thallium	0.05	UG/L	U, B
A-65-36	05/23/05	Uranium	2	UG/L	B
BLR-DP-L352	03/01/05	Uranium	4.8	UG/L	B
BLR-SP-L167	05/23/05	Uranium	36.8	UG/L	
TF-AL-L35	05/23/05	Uranium	20.1	UG/L	B
TF-SP-L118	03/01/05	Uranium	187	UG/L	
A-65-36	05/23/05	Vanadium	11.7	UG/L	B
BLR-DP-L352	03/01/05	Vanadium	113	UG/L	
BLR-SP-L167	05/23/05	Vanadium	5.3	UG/L	B
TF-AL-L35	05/23/05	Vanadium	8.9	UG/L	B
TF-SP-L118	03/01/05	Vanadium	36.3	UG/L	B
A-65-36	05/23/05	Zinc	119	UG/L	
BLR-DP-L352	03/01/05	Zinc	339	UG/L	
BLR-SP-L167	05/23/05	Zinc	31.7	UG/L	
TF-AL-L35	05/23/05	Zinc	30	UG/L	
TF-SP-L118	03/01/05	Zinc	225	UG/L	
A-65-36	05/23/05	Zirconium	0.5	UG/L	U
BLR-DP-L352	03/01/05	Zirconium	0.216	UG/L	U
BLR-SP-L167	05/23/05	Zirconium	0.5	UG/L	U
TF-AL-L35	05/23/05	Zirconium	0.5	UG/L	U
TF-SP-L118	03/01/05	Zirconium	0.25	UG/L	B

Data Qualifier Flags:
B = IDL ≤ value < CRDL
E = serial dilutions outside limits
H = holding time exceeded
J = estimated value
R = rejected value
U = not detected
UJ = not detected, quantitation limit is an estimate

Table B-5. Perched water level measurements for 2004-2005.

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
33-1	01/12/04			Y
33-1	02/12/04			Y
33-1	03/17/04			Y
33-1	04/12/04	101.46	4815.36	
33-1	05/10/04	101.39	4815.25	
33-1	06/07/04	101.36	4815.45	
33-1	06/16/04	101.15	4813.18	
33-1	06/23/04	101.75	4815.07	
33-1	06/28/04			Y
33-1	07/12/04	102.43	4814.37	
33-1	08/23/04	101.87	4814.94	
33-1	09/27/04	101.24	4815.58	
33-1	10/25/04	101.07	4815.75	
33-1	11/18/04			Y
33-1	12/20/04	101.45	4815.37	
33-1	01/17/05	101.13	4815.69	
33-1	02/02/05			Y
33-1	03/16/05	101.13	4815.69	
33-1	04/13/05	100.14	4816.68	
33-1	05/16/05	100.12	4816.7	
33-1	06/16/05	100.13	4816.69	
33-1	07/19/05	100.36	4816.46	
33-2	01/12/04	102.43	4812.68	
33-2	02/11/04	103.8	4811.31	
33-2	03/17/04	100.9	4814.21	
33-2	04/14/04	102.09	4813.02	
33-2	05/10/04	102.08	4812.95	
33-2	06/10/04	102.58	4812.53	
33-2	07/12/04	103.29	4811.83	
33-2	08/23/04	102.02	4813.1	
33-2	09/27/04	101.89	4813.22	
33-2	10/25/04	101	4814.11	
33-2	11/18/04	102.29	4812.82	
33-2	12/16/04	102.18	4812.93	
33-2	01/17/05	101.49	4813.62	
33-2	02/15/05	101.79	4813.32	
33-2	03/16/05	98.97	4816.14	
33-2	04/05/05	98.58	4816.53	
33-2	05/16/05	98.51	4816.6	
33-2	06/15/05	98.54	4816.57	
33-2	06/27/05	98.57	4816.54	
33-2	07/18/05	99.37	4815.74	

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
33-3	01/12/04	117.95	4797.94	
33-3	02/11/04	118.75	4797.14	
33-3	03/17/04	119.27	4796.62	
33-3	04/14/04	118.89	4797	
33-3	05/18/04	119.67	4796.24	
33-3	06/10/04	120.14	4795.77	
33-3	07/14/04	120.12	4795.77	
33-3	08/23/04	119.91	4796	
33-3	09/27/04	119.58	4796.31	
33-3	10/25/04	119.79	4796.1	
33-3	11/18/04	119.86	4795.25	
33-3	11/23/04	119.83	4796.06	
33-3	12/16/04	120.04	4795.85	
33-3	01/18/05	119.17	4796.72	
33-3	01/26/05	119.78	4796.11	
33-3	02/08/05	120.03	4795.86	
33-3	03/14/05	119.95	4795.94	
33-3	04/11/05	119.17	4796.72	
33-3	05/17/05	117.5	4798.39	
33-3	06/15/05	118.13	4797.76	
33-3	07/21/05	118.57	4797.32	
33-4-1	01/12/04	98.77	4814.45	
33-4-1	02/16/04	98.76	4814.46	
33-4-1	03/10/04	98.82	4814.4	
33-4-1	03/17/04	98.79	4814.43	
33-4-1	04/12/04	98.79	4814.43	
33-4-1	05/10/04	98.67	4814.38	
33-4-1	06/10/04	98.73	4814.5	
33-4-1	07/12/04	101.62	4811.61	
33-4-1	08/23/04	98.72	4814.51	
33-4-1	09/27/04	98.78	4814.44	
33-4-1	10/25/04	98.66	4814.56	
33-4-1	11/18/04	98.68	4814.54	
33-4-1	12/16/04	100.2	4813.02	
33-4-1	01/17/05	98.68	4814.54	
33-4-1	02/15/05	98.68	4814.54	
33-4-1	03/14/05	98.63	4814.59	
33-4-1	03/16/05	98.62	4814.6	
33-4-1	04/05/05	98.45	4814.77	
33-4-1	05/16/05	98.55	4814.67	
33-4-1	06/15/05	98.62	4814.6	
33-4-1	07/18/05	98.63	4814.59	
33-4-2	01/12/04			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
33-4-2	02/16/04			Y
33-4-2	03/17/04			Y
33-4-2	04/12/04			Y
33-4-2	05/18/04			Y
33-4-2	06/10/04			Y
33-4-2	07/12/04			Y
33-4-2	08/23/04			Y
33-4-2	09/27/04			Y
33-4-2	10/25/04			Y
33-4-2	11/18/04			Y
33-4-2	12/16/04			Y
33-4-2	01/17/05			Y
33-4-2	02/07/05			Y
33-4-2	03/14/05			Y
33-4-2	04/05/05			Y
33-4-2	05/16/05			Y
33-4-2	06/15/05			Y
33-4-2	07/18/05			Y
37-4	01/12/04	108.36	4803.66	
37-4	02/17/04	108.22	4803.8	
37-4	03/17/04	107.41	4804.61	
37-4	04/12/04	106.5	4805.52	
37-4	05/10/04	106.08	4805.93	
37-4	06/10/04	106.41	4805.56	
37-4	07/12/04	105.94	4806.11	
37-4	08/23/04	105.66	4806.35	
37-4	09/27/04	105.71	4806.31	
37-4	10/20/04	105.31	4806.71	
37-4	11/18/04	105.28	4806.74	
37-4	12/20/04	105.21	4806.81	
37-4	01/17/05	105.67	4806.35	
37-4	02/15/05	105.97	4806.05	
37-4	03/16/05	105.54	4806.48	
37-4	04/05/05	104.97	4807.05	
37-4	05/16/05	103.68	4808.34	
37-4	06/15/05	102.45	4809.57	
37-4	07/18/05	102.48	4809.54	
55-06	01/12/04	106.31	4807.28	
55-06	02/17/04	105.3	4808.29	
55-06	03/17/04	105.09	4808.5	
55-06	04/12/04	105.45	4808.14	
55-06	05/10/04	105.61	4808.03	
55-06	06/07/04	106.01	4807.618	

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
55-06	07/12/04	106.43	4807.19	
55-06	07/29/04	110.48	4803.11	
55-06	08/23/04	106.05	4807.59	
55-06	09/27/04	106.53	4807.06	
55-06	10/25/04	106.06	4807.53	
55-06	11/18/04	105.82	4807.77	
55-06	12/20/04	105.91	4807.71	
55-06	01/11/05	106.91	4806.68	
55-06	01/17/05	105.93	4807.66	
55-06	03/16/05	106.24	4807.35	
55-06	04/12/05	105.45	4808.14	
55-06	05/16/05	105.66	4807.93	
55-06	06/15/05	105.53	4808.06	
55-06	07/18/05	106.15	4807.44	
BLR-AL	01/14/04			Y
BLR-AL	02/16/04			Y
BLR-AL	03/18/04			Y
BLR-AL	04/14/04			Y
BLR-AL	05/18/04			Y
BLR-AL	06/10/04			Y
BLR-AL	07/14/04			Y
BLR-AL	08/24/04			Y
BLR-AL	09/28/04			Y
BLR-AL	10/20/04			Y
BLR-AL	11/22/04			Y
BLR-AL	12/16/04			Y
BLR-AL	01/18/05			Y
BLR-AL	02/07/05			Y
BLR-AL	03/14/05			Y
BLR-AL	04/05/05			Y
BLR-AL	05/17/05			Y
BLR-AL	06/15/05			Y
BLR-AL	07/19/05			Y
BLR-CH	01/14/04	130.8	4785.27	
BLR-CH	02/16/04	128.03	4788.04	
BLR-CH	03/18/04	128.22	4787.85	
BLR-CH	04/14/04	127.68	4788.39	
BLR-CH	05/18/04	126.26	4789.8	
BLR-CH	06/10/04	124.17	4791.9	
BLR-CH	07/14/04	124.15	4791.91	
BLR-CH	08/24/04	121.66	4794.41	
BLR-CH	09/28/04	121.53	4794.54	
BLR-CH	10/20/04	121.49	4794.58	
BLR-CH	11/22/04	127.52	4788.55	
INTEC Perched Monitoring Wells				
BLR-CH	12/16/04	130.19	4785.88	
BLR-CH	01/12/05	130.5	4785.57	
BLR-CH	01/18/05	130.88	4785.19	
BLR-CH	02/08/05	130.65	4785.42	
BLR-CH	03/14/05	130.77	4785.3	
BLR-CH	04/05/05	130.01	4786.06	
BLR-CH	05/17/05	130.21	4785.86	
BLR-CH	06/15/05	121.9	4794.17	
BLR-CH	07/19/05	129.39	4786.68	
BLR-DP	01/14/04	384.96	4530.87	
BLR-DP	02/16/04	384.86	4530.96	
BLR-DP	03/18/04	384.67	4531.16	
BLR-DP	04/14/04	384.3	4531.52	
BLR-DP	05/18/04	383.71	4532.13	
BLR-DP	06/10/04	383.43	4532.4	
BLR-DP	07/14/04	382.84	4532.98	
BLR-DP	08/24/04	382.04	4533.79	
BLR-DP	09/28/04	381.73	4534.1	
BLR-DP	10/20/04	380.28	4535.55	
BLR-DP	11/22/04	380.77	4535.06	
BLR-DP	12/16/04	382.05	4533.78	
BLR-DP	01/18/05	382.07	4533.76	
BLR-DP	02/15/05	381.75	4534.08	
BLR-DP	03/14/05	382.06	4533.76	
BLR-DP	04/05/05	382.61	4533.22	
BLR-DP	05/17/05	382.16	4533.66	
BLR-DP	06/15/05	382.61	4533.22	
BLR-DP	07/19/05	382.46	4533.37	
BLR-SP	01/14/04			Y
BLR-SP	02/16/04			Y
BLR-SP	03/18/04			Y
BLR-SP	04/14/04			Y
BLR-SP	05/18/04			Y
BLR-SP	06/10/04			Y
BLR-SP	07/14/04			Y
BLR-SP	08/24/04			Y
BLR-SP	09/28/04			Y
BLR-SP	10/20/04			Y
BLR-SP	11/22/04			Y
BLR-SP	12/16/04			Y
BLR-SP	01/12/05			Y
BLR-SP	02/15/05			Y
BLR-SP	03/14/05			Y
BLR-SP	04/05/05			Y
INTEC Perched Monitoring Wells				
BLR-SP	05/17/05			Y
BLR-SP	06/15/05			Y
BLR-SP	07/19/05			Y
CS-AL	01/12/04			Y
CS-AL	02/16/04			Y
CS-AL	03/18/04			Y
CS-AL	04/14/04			Y
CS-AL	05/19/04			Y
CS-AL	06/16/04			Y
CS-AL	07/14/04			Y
CS-AL	08/23/04			Y
CS-AL	09/28/04			Y
CS-AL	10/20/04			Y
CS-AL	11/22/04			Y
CS-AL	12/16/04			Y
CS-AL	01/11/05			Y
CS-AL	02/07/05			Y
CS-AL	03/14/05			Y
CS-AL	04/05/05			Y
CS-AL	05/17/05			Y
CS-AL	06/15/05			Y
CS-AL	07/19/05			Y
CS-CH	01/12/04	191.36	4725.67	
CS-CH	02/16/04	190.69	4726.34	
CS-CH	03/18/04	190.56	4726.47	
CS-CH	04/14/04	190.23	4726.8	
CS-CH	05/19/04	190.09	4726.94	
CS-CH	06/16/04	190.2	4726.83	
CS-CH	07/14/04	190.08	4726.95	
CS-CH	08/23/04	189.52	4727.5	
CS-CH	09/28/04	189.94	4727.09	
CS-CH	10/20/04	189.14	4727.89	
CS-CH	11/22/04	189.71	4727.32	
CS-CH	12/16/04	191.01	4726.02	
CS-CH	01/11/05	189.25	4727.78	
CS-CH	02/15/05	189.69	4727.34	
CS-CH	03/14/05	189.32	4727.71	
CS-CH	04/05/05	189.4	4727.63	
CS-CH	05/17/05	188.41	4728.62	
CS-CH	06/15/05	188.7	4728.33	
CS-CH	07/19/05	188.37	4728.66	
CS-DP-1	01/12/04			Y
CS-DP-1	02/16/04			Y
CS-DP-1	03/18/04	296.57	4620.22	

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
CS-DP-1	04/14/04	295.27	4621.52	
CS-DP-1	05/19/04	293.61	4623.16	
CS-DP-1	06/16/04	293.23	4623.58	
CS-DP-1	07/14/04	293.41	4623.35	
CS-DP-1	08/23/04	293.7	4623.09	
CS-DP-1	10/20/04	264.35	4652.44	
CS-DP-1	11/22/04	295.48	4621.31	
CS-DP-1	12/16/04	296.22	4620.57	
CS-DP-1	01/11/05	297.6	4619.19	
CS-DP-1	02/15/05			Y
CS-DP-1	03/14/05			Y
CS-DP-1	04/05/05			Y
CS-DP-1	05/17/05			Y
CS-DP-1	06/15/05			Y
CS-DP-1	07/19/05			Y
CS-DP-4	01/12/04			Y
CS-DP-4	02/16/04			Y
CS-DP-4	03/18/04			Y
CS-DP-4	04/14/04			Y
CS-DP-4	05/19/04			Y
CS-DP-4	06/16/04			Y
CS-DP-4	07/14/04			Y
CS-DP-4	08/23/04			Y
CS-DP-4	09/28/04			Y
CS-DP-4	10/20/04			Y
CS-DP-4	11/22/04			Y
CS-DP-4	12/16/04			Y
CS-DP-4	01/11/05			Y
CS-DP-4	02/07/05			Y
CS-DP-4	03/14/05			Y
CS-DP-4	04/05/05			Y
CS-DP-4	05/17/05			Y
CS-DP-4	06/15/05			Y
CS-DP-4	07/19/05			Y
CS-SP	01/12/04			Y
CS-SP	02/16/04			Y
CS-SP	03/18/04			Y
CS-SP	04/14/04			Y
CS-SP	05/19/04			Y
CS-SP	06/16/04			Y
CS-SP	07/14/04			Y
CS-SP	08/23/04			Y
CS-SP	09/28/04			Y
CS-SP	10/20/04			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
CS-SP	12/16/04			Y
CS-SP	01/11/05			Y
CS-SP	02/15/05			Y
CS-SP	03/14/05			Y
CS-SP	04/05/05			Y
CS-SP	05/17/05			Y
CS-SP	06/15/05			Y
CS-SP	07/19/05			Y
MW-10-1	01/12/04			Y
MW-10-1	02/17/04			Y
MW-10-1	03/17/04			Y
MW-10-1	04/12/04			Y
MW-10-1	05/18/04			Y
MW-10-1	06/23/04			Y
MW-10-1	07/14/04			Y
MW-10-1	08/23/04			Y
MW-10-1	09/27/04			Y
MW-10-1	10/25/04			Y
MW-10-1	11/18/04			Y
MW-10-1	12/20/04			Y
MW-10-1	01/18/05			Y
MW-10-1	02/16/05			Y
MW-10-1	03/14/05			Y
MW-10-1	04/05/05	80.31	4836.25	
MW-10-1	05/16/05	80.22	4836.34	
MW-10-1	06/16/05	80.13	4836.43	
MW-10-1	07/18/05			Y
MW-10-2	01/12/04	148.19	4768.37	
MW-10-2	02/17/04	148.28	4768.28	
MW-10-2	03/17/04			Y
MW-10-2	04/12/04	147.96	4768.6	
MW-10-2	05/18/04	145.41	4771.16	
MW-10-2	06/23/04	148.33	4768.24	
MW-10-2	07/12/04	148.1	4768.46	
MW-10-2	07/14/04	151.84	4764.73	
MW-10-2	08/23/04	148.3	4768.31	
MW-10-2	09/27/04	148.44	4768.12	
MW-10-2	10/25/04	148.26	4768.3	
MW-10-2	11/18/04	148.57	4767.99	
MW-10-2	12/20/04	148.6	4767.96	
MW-10-2	01/18/05	148.77	4767.79	
MW-10-2	02/02/05	148.78	4767.78	
MW-10-2	03/14/05	148.43	4768.13	
MW-10-2	04/05/05	148.45	4768.11	

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-10-2	05/16/05	150.28	4766.28	
MW-10-2	06/16/05	148.61	4767.95	
MW-10-2	07/18/05	148.68	4767.88	
MW-1-1	01/12/04			Y
MW-1-1	02/17/04			Y
MW-1-1	03/18/04			Y
MW-1-1	05/18/04			Y
MW-1-1	06/23/04			
MW-1-1	07/12/04			
MW-1-1	08/23/04			Y
MW-1-1	09/27/04			Y
MW-1-1	10/20/04			Y
MW-1-1	11/23/04			Y
MW-1-1	12/16/04			Y
MW-1-1	01/18/05			Y
MW-1-1	02/15/05			Y
MW-1-1	03/14/05			Y
MW-1-1	04/12/05			Y
MW-1-1	06/15/05			Y
MW-11-1	01/12/04			Y
MW-11-1	02/16/04			Y
MW-11-1	03/18/04			Y
MW-11-1	04/14/04			Y
MW-11-1	05/19/04			Y
MW-11-1	06/16/04			Y
MW-11-1	07/14/04			Y
MW-11-1	08/23/04			Y
MW-11-1	09/28/04			Y
MW-11-1	10/20/04			Y
MW-11-1	11/22/04			Y
MW-11-1	12/16/04			Y
MW-11-1	01/11/05			Y
MW-11-1	02/15/05			Y
MW-11-1	03/14/05			Y
MW-11-1	04/05/05			Y
MW-11-1	05/16/05			Y
MW-11-1	06/16/05			Y
MW-11-1	07/18/05			Y
MW-11-2	01/12/04			Y
MW-11-2	02/16/04			Y
MW-11-2	03/18/04			Y
MW-11-2	04/14/04			Y
MW-11-2	05/19/04			Y
MW-11-2	06/16/04			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-11-2	08/23/04			Y
MW-11-2	09/28/04			Y
MW-11-2	10/20/04			Y
MW-11-2	11/22/04			Y
MW-11-2	12/16/04			Y
MW-11-2	01/11/05			Y
MW-11-2	02/07/05			Y
MW-11-2	03/14/05			Y
MW-11-2	04/05/05			Y
MW-11-2	05/16/05			Y
MW-11-2	06/16/05			Y
MW-11-2	07/18/05			Y
MW-12-1	01/12/04			Y
MW-12-1	02/17/04			Y
MW-12-1	03/17/04			Y
MW-12-1	04/14/04			Y
MW-12-1	05/10/04			Y
MW-12-1	06/23/04			Y
MW-12-1	07/12/04			Y
MW-12-1	08/23/04			Y
MW-12-1	09/27/04			Y
MW-12-1	10/25/04			Y
MW-12-1	11/18/04			Y
MW-12-1	12/20/04			Y
MW-12-1	01/17/05			Y
MW-12-1	03/16/05			Y
MW-12-1	04/12/05			Y
MW-12-1	05/16/05			Y
MW-12-1	06/15/05			Y
MW-12-1	07/18/05			Y
MW-12-2	01/12/04			Y
MW-12-2	02/17/04			Y
MW-12-2	03/17/04			Y
MW-12-2	04/14/04			Y
MW-12-2	05/10/04			Y
MW-12-2	06/23/04			Y
MW-12-2	07/12/04			Y
MW-12-2	08/23/04			Y
MW-12-2	09/27/04			Y
MW-12-2	10/25/04			Y
MW-12-2	11/18/04			Y
MW-12-2	12/20/04			Y
MW-12-2	01/17/05			Y
MW-12-2	03/16/05			Y
INTEC Perched Monitoring Wells				
MW-12-2	04/12/05			Y
MW-12-2	05/16/05			Y
MW-12-2	06/15/05			Y
MW-12-2	07/18/05			Y
MW-13	01/12/04			Y
MW-13	02/17/04			Y
MW-13	03/18/04			Y
MW-13	04/14/04	107.22	4813.86	
MW-13	05/18/04			
MW-13	06/16/04			
MW-13	07/12/04	107.21	4813.91	
MW-13	08/23/04	107.89	4813.19	
MW-13	09/27/04	107.3	4813.78	
MW-13	10/20/04	107.03	4814.05	
MW-13	11/23/04	107.13	4813.95	
MW-13	12/20/04	107.16	4813.92	
MW-13	01/11/05	100	4821.08	
MW-13	02/15/05	107.1	4813.98	
MW-13	03/14/05	107.11	4813.97	
MW-13	04/05/05	107.04	4814.04	
MW-13	05/17/05			Y
MW-13	06/15/05			Y
MW-13	07/19/05			Y
MW-14	01/12/04			Y
MW-14	02/12/04			Y
MW-14	03/18/04			Y
MW-14	04/14/04			Y
MW-14	05/18/04			Y
MW-14	06/16/04			Y
MW-14	07/12/04			Y
MW-14	08/23/04			Y
MW-14	09/28/04			Y
MW-14	10/20/04			Y
MW-14	11/23/04			Y
MW-14	01/11/05			Y
MW-14	02/07/05			Y
MW-14	03/14/05			Y
MW-14	04/05/05			Y
MW-14	05/17/05			Y
MW-14	06/15/05			Y
MW-14	07/19/05			Y
MW-1-4	01/12/04	329.56	4589.06	
MW-1-4	02/17/04	329.4	4589.23	
MW-1-4	03/18/04	328.54	4590.08	
INTEC Perched Monitoring Wells				
MW-1-4	05/18/04	329.42	4589.23	
MW-1-4	06/23/04	325.68	4593.21	
MW-1-4	07/12/04	325.75	4593.14	
MW-1-4	08/23/04	325.25	4593.4	
MW-1-4	09/27/04	326.65	4591.97	
MW-1-4	10/20/04	325.21	4593.41	
MW-1-4	11/23/04	327.31	4591.31	
MW-1-4	12/16/04	329.62	4589	
MW-1-4	01/18/05	329.56	4589.06	
MW-1-4	02/15/05	328.53	4590.09	
MW-1-4	03/14/05	328.6	4590.03	
MW-1-4	04/12/05	326.49	4592.14	
MW-1-4	05/17/05	325.16	4593.47	
MW-1-4	06/15/05	319.14	4599.49	
MW-15	01/12/04			Y
MW-15	02/17/04			Y
MW-15	03/18/04			Y
MW-15	04/14/04			Y
MW-15	05/18/04			Y
MW-15	06/16/04			Y
MW-15	07/12/04			Y
MW-15	08/23/04	107.89	4812.37	
MW-15	09/27/04	109.17	4811.07	
MW-15	10/20/04	107.8	4812.44	
MW-15	11/23/04	108.19	4812.05	
MW-15	12/20/04	107.94	4812.3	
MW-15	01/11/05	107.3	4812.94	
MW-15	02/15/05			
MW-15	03/14/05			
MW-15	05/17/05			
MW-15	06/15/05			
MW-15	08/01/05			Y
MW-16	01/12/04			Y
MW-16	02/16/04			Y
MW-16	03/18/04			Y
MW-16	04/14/04			Y
MW-16	05/18/04			Y
MW-16	06/16/04			Y
MW-16	07/12/04			Y
MW-16	08/23/04			Y
MW-16	09/28/04			Y
MW-16	10/20/04			Y
MW-16	11/23/04			Y
MW-16	12/20/04			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-16	01/11/05			Y
MW-16	02/07/05			Y
MW-16	03/14/05			Y
MW-16	04/05/05			Y
MW-16	05/17/05			Y
MW-16	06/15/05			Y
MW-16	07/19/05			Y
MW-17-1	01/12/04			Y
MW-17-1	02/16/04			Y
MW-17-1	03/18/04			Y
MW-17-1	04/14/04			Y
MW-17-1	05/18/04			Y
MW-17-1	06/16/04			Y
MW-17-1	07/12/04			Y
MW-17-1	08/23/04			Y
MW-17-1	09/28/04			Y
MW-17-1	10/20/04			Y
MW-17-1	11/23/04			Y
MW-17-1	12/20/04			Y
MW-17-1	01/11/05			Y
MW-17-1	02/15/05			Y
MW-17-1	03/14/05			Y
MW-17-1	04/05/05			Y
MW-17-1	05/17/05			Y
MW-17-1	06/15/05			Y
MW-17-1	07/19/05			Y
MW-17-2	01/12/04	191.14	4729.75	
MW-17-2	02/16/04	191.13	4729.76	
MW-17-2	03/18/04	190.68	4730.21	
MW-17-2	04/14/04			Y
MW-17-2	05/18/04	189.84	4731.08	
MW-17-2	06/16/04	190.17	4730.73	
MW-17-2	07/12/04	190.12	4730.81	
MW-17-2	08/23/04	190.03	4730.86	
MW-17-2	09/28/04	189.9	4730.99	
MW-17-2	10/20/04	188.81	4732.08	
MW-17-2	11/23/04	188.76	4732.13	
MW-17-2	12/20/04	188.61	4732.28	
MW-17-2	01/11/05	187.93	4732.96	
MW-17-2	02/15/05	181.11	4739.78	
MW-17-2	03/14/05	188	4732.89	
MW-17-2	04/05/05	187.92	4732.97	
MW-17-2	05/17/05	188.71	4732.18	
MW-17-2	06/15/05	187.7	4733.19	
INTEC Perched Monitoring Wells				
MW-17-2	07/19/05	187.74	4733.15	
MW-17-4	02/16/04	367.92	4553.35	
MW-17-4	03/18/04			
MW-17-4	04/14/04			Y
MW-17-4	05/18/04			
MW-17-4	06/16/04	367.89	4553.38	
MW-17-4	07/12/04	367.89	4553.39	
MW-17-4	08/23/04	367.63	4550.79	
MW-17-4	09/28/04	367.44	4553.83	
MW-17-4	10/20/04	367.32	4553.95	
MW-17-4	11/23/04	367.12	4554.15	
MW-17-4	12/20/04	366.14	4555.13	
MW-17-4	01/11/05	365.28	4555.99	
MW-17-4	02/15/05	364.92	4556.35	
MW-17-4	03/14/05	365.18	4556.09	
MW-17-4	04/05/05	365.03	4556.24	
MW-17-4	05/17/05	364.57	4556.7	
MW-17-4	06/15/05	364.96	4556.31	
MW-17-4	07/19/05	364.79	4556.48	
MW-18-1	01/12/04			Y
MW-18-1	02/17/04	408.8	4507.69	
MW-18-1	03/17/04	407.56	4508.93	
MW-18-1	04/12/04	408.26	4508.23	
MW-18-1	05/10/04	406.81	4509.48	
MW-18-1	06/23/04	407.21	4509.29	
MW-18-1	07/12/04	407.58	4508.91	
MW-18-1	08/23/04	408.21	4508.28	
MW-18-1	09/27/04	408.77	4507.72	
MW-18-1	10/25/04	408.5	4507.99	
MW-18-1	11/18/04	409.66	4506.83	
MW-18-1	12/20/04	409.01	4507.48	
MW-18-1	01/17/05			Y
MW-18-1	02/16/05			Y
MW-18-1	03/16/05			Y
MW-18-1	04/12/05			Y
MW-18-1	05/16/05			Y
MW-18-1	06/16/05			Y
MW-18-1	07/18/05			Y
MW-18-2	01/12/04			Y
MW-18-2	02/17/04			Y
MW-18-2	03/17/04			Y
MW-18-2	04/12/04			Y
MW-18-2	05/10/04			Y
MW-18-2	06/23/04			Y
INTEC Perched Monitoring Wells				
MW-18-2	07/12/04			Y
MW-18-2	08/23/04			Y
MW-18-2	09/27/04			Y
MW-18-2	10/25/04			Y
MW-18-2	11/18/04			Y
MW-18-2	12/20/04			Y
MW-18-2	01/17/05			Y
MW-18-2	02/16/05			Y
MW-18-2	03/16/05			Y
MW-18-2	04/12/05			Y
MW-18-2	05/16/05			Y
MW-18-2	06/16/05			Y
MW-18-2	07/18/05			Y
MW-2	01/12/04	107.95	4806.88	
MW-2	02/17/04	106.78	4808.06	
MW-2	03/17/04	106.4	4808.44	
MW-2	04/12/04	106.73	4808.1	
MW-2	05/10/04	106.93	4807.91	
MW-2	06/23/04	107.64	4807.19	
MW-2	07/12/04	107.87	4806.96	
MW-2	08/23/04	107.43	4807.42	
MW-2	09/27/04	107.87	4806.96	
MW-2	10/25/04	107.52	4807.32	
MW-2	11/18/04	107.43	4807.4	
MW-2	12/20/04	107.32	4807.52	
MW-2	01/17/05	107.26	4807.58	
MW-2	01/17/05	107.33	4807.5	
MW-2	02/01/05	107.15	4807.68	
MW-2	03/16/05	107.61	4807.22	
MW-2	04/12/05	106.72	4808.12	
MW-2	05/16/05	107.05	4807.78	
MW-2	07/18/05	107.36	4807.48	
MW-20-1	01/14/04	108.61	4807.58	
MW-20-1	02/17/04	108.71	4807.48	
MW-20-1	03/17/04	108.58	4807.61	
MW-20-1	04/12/04	109.03	4807.16	
MW-20-1	05/18/04	109.21	4806.99	
MW-20-1	06/07/04			Y
MW-20-1	07/14/04			Y
MW-20-1	08/23/04	109.42	4806.78	
MW-20-1	09/28/04			Y
MW-20-1	10/25/04			Y
MW-20-1	11/18/04			Y
MW-20-1	12/20/04			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-20-1	01/11/05	109.03	4807.16	
MW-20-1	02/15/05			Y
MW-20-1	03/14/05	109.41	4806.78	
MW-20-1	04/05/05	109.53	4777.25	
MW-20-1	05/17/05	109	4807.19	
MW-20-1	06/15/05	109.36	4806.83	
MW-20-1	07/19/05			Y
MW-20-2	01/14/04	135.77	4780.42	
MW-20-2	02/17/04	135.34	4780.85	
MW-20-2	03/17/04	135.17	4781.02	
MW-20-2	04/12/04	135.55	4780.64	
MW-20-2	05/18/04	136.75	4779.45	
MW-20-2	06/07/04	137.58	4778.62	
MW-20-2	07/14/04	138.96	4777.24	
MW-20-2	08/23/04	139.02	4777.18	
MW-20-2	09/28/04	139.53	4776.66	
MW-20-2	10/25/04	139.29	4776.9	
MW-20-2	11/18/04	139.99	4776.2	
MW-20-2	12/20/04	139.96	4776.23	
MW-20-2	01/11/05	139.01	4777.18	
MW-20-2	02/09/05	139.9	4776.29	
MW-20-2	03/14/05	139.8	4776.39	
MW-20-2	04/05/05	138.94	4806.66	
MW-20-2	05/17/05	136.48	4779.71	
MW-20-2	06/15/05	136.53	4779.66	
MW-20-2	07/19/05	137	4779.19	
MW-24	01/14/04	62.3	4847.05	
MW-24	01/21/04	61.57	4847.78	
MW-24	02/23/04	62.52	4846.83	
MW-24	03/18/04	62.43	4846.92	
MW-24	04/12/04	62.45	4846.9	
MW-24	05/08/04	62.05	4846.22	
MW-24	05/19/04	63.06	4846.28	
MW-24	06/28/04	62.44	4846.9	
MW-24	07/14/04	62.48	4846.86	
MW-24	08/24/04	62.72	4846.63	
MW-24	09/29/04	68.13	4841.22	
MW-24	10/28/04	62.39	4846.96	
MW-24	11/17/04	62.39	4846.96	
MW-24	12/17/04	64.78	4844.57	
MW-24	01/19/05	71.11	4838.24	
MW-24	02/14/05	72.79	4836.56	
MW-24	03/16/05	74.93	4834.42	
MW-24	04/13/05			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-24	05/19/05	74.99	4834.36	
MW-24	06/27/05			Y
MW-24	07/21/05			Y
MW-24	08/01/05			Y
MW-3-1	01/14/04			Y
MW-3-1	02/16/04			Y
MW-3-1	03/18/04			Y
MW-3-1	04/14/04			Y
MW-3-1	05/18/04			Y
MW-3-1	06/16/04			Y
MW-3-1	07/12/04			Y
MW-3-1	08/23/04			Y
MW-3-1	09/29/04	122.03	4795.62	
MW-3-1	10/20/04			Y
MW-3-1	11/23/04			Y
MW-3-1	12/16/04			Y
MW-3-1	01/12/05			Y
MW-3-1	02/15/05			Y
MW-3-1	03/14/05			Y
MW-3-1	04/05/05			Y
MW-3-1	05/16/05			Y
MW-3-1	06/15/05			Y
MW-3-1	07/21/05			Y
MW-3-2	01/14/04	135.67	4781.98	
MW-3-2	02/16/04	134.32	4783.33	
MW-3-2	03/18/04	133.95	4783.7	
MW-3-2	04/14/04	134.05	4783.6	
MW-3-2	05/18/04	134.52	4783.13	
MW-3-2	06/16/04	136.26	4781.4	
MW-3-2	07/12/04	137.32	4780.34	
MW-3-2	08/23/04	138.59	4779.07	
MW-3-2	09/29/04	140.38	4777.27	
MW-3-2	10/20/04	140.15	4777.5	
MW-3-2	11/23/04	140.18	4777.47	
MW-3-2	12/16/04	140.18	4777.47	
MW-3-2	01/12/05	140.18	4777.47	
MW-3-2	02/07/05	140.25	4777.4	
MW-3-2	03/14/05	140.18	4777.47	
MW-3-2	04/05/05	140.18	4777.47	
MW-3-2	05/16/05	140.19	4777.46	
MW-3-2	06/15/05	140.18	4777.47	
MW-3-2	07/21/05	140.18	4777.47	
MW-4-1	01/12/04	131.9	4781.51	
MW-4-1	02/16/04	131.74	4781.67	

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-4-1	03/17/04	131.73	4781.68	
MW-4-1	04/14/04	131.73	4781.68	
MW-4-1	05/10/04	131.42	4782	
MW-4-1	06/23/04	122.75	4790.68	
MW-4-1	07/12/04	131.86	4781.57	
MW-4-1	08/23/04	131.65	4781.78	
MW-4-1	09/27/04	131.89	4781.52	
MW-4-1	10/20/04	131.65	4781.76	
MW-4-1	11/18/04	131.88	4781.53	
MW-4-1	12/20/04	131.39	4782.02	
MW-4-1	01/17/05	132.03	4781.38	
MW-4-1	02/15/05	132.01	4781.4	
MW-4-1	03/16/05	131.7	4781.71	
MW-4-1	04/05/05	132.26	4781.15	
MW-4-1	05/16/05	131.47	4781.94	
MW-4-1	06/15/05	131.89	4781.52	
MW-4-1	07/18/05	131.82	4781.59	
MW-4-2	01/12/04			Y
MW-4-2	02/16/04			Y
MW-4-2	03/17/04			Y
MW-4-2	04/14/04			Y
MW-4-2	05/10/04			Y
MW-4-2	06/23/04			Y
MW-4-2	07/12/04			Y
MW-4-2	09/27/04			Y
MW-4-2	10/20/04			Y
MW-4-2	11/18/04			Y
MW-4-2	12/20/04			Y
MW-4-2	01/17/05			Y
MW-4-2	02/07/05			Y
MW-4-2	03/16/05			Y
MW-4-2	04/05/05			Y
MW-4-2	05/16/05			Y
MW-4-2	06/15/05			Y
MW-4-2	07/18/05			Y
MW-5-1	01/12/04			Y
MW-5-1	02/17/04			Y
MW-5-1	03/09/04			Y
MW-5-1	03/17/04			Y
MW-5-1	04/12/04			Y
MW-5-1	05/10/04			Y
MW-5-1	06/23/04			Y
MW-5-1	07/12/04			Y
MW-5-1	08/23/04			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-5-1	09/27/04			Y
MW-5-1	10/25/04			Y
MW-5-1	11/18/04			Y
MW-5-1	12/20/04			Y
MW-5-1	01/17/05			Y
MW-5-1	02/16/05			Y
MW-5-1	03/16/05			Y
MW-5-1	04/12/05			Y
MW-5-1	05/16/05			Y
MW-5-1	06/16/05			Y
MW-5-1	07/18/05			Y
MW-5-2	01/12/04	110.08	4807.9	
MW-5-2	02/17/04			
MW-5-2	03/09/04	109.69	4808.29	
MW-5-2	03/17/04	109.63	4808.35	
MW-5-2	04/12/04	110.05	4807.93	
MW-5-2	05/10/04	110.39	4807.58	
MW-5-2	06/23/04	113.46	4804.5	
MW-5-2	07/12/04	113.64	4804.3	
MW-5-2	08/23/04	113.62	4804.35	
MW-5-2	09/27/04	117.08	4800.9	
MW-5-2	10/25/04	119.06	4798.92	
MW-5-2	11/18/04	118.88	4799.1	
MW-5-2	11/22/04	118.71	4799.27	
MW-5-2	12/20/04	118.39	4799.59	
MW-5-2	01/17/05	119.54	4798.44	
MW-5-2	02/01/05	120.17	4797.81	
MW-5-2	03/16/05	120.07	4797.91	
MW-5-2	04/12/05	120.47	4797.51	
MW-5-2	05/16/05	122.37	4795.61	
MW-5-2	06/16/05	121.02	4796.96	
MW-5-2	07/18/05	120.31	4797.67	
MW-6	01/14/04	122.06	4796.38	
MW-6	02/17/04	123.7	4794.74	
MW-6	03/18/04	124.2	4794.24	
MW-6	04/14/04	124.62	4793.82	
MW-6	05/18/04	125.11	4793.36	
MW-6	06/16/04	125.64	4792.8	
MW-6	07/12/04	124.94	4793.5	
MW-6	08/23/04	122.77	4795.68	
MW-6	09/27/04	121.87	4796.57	
MW-6	10/25/04	123.23	4795.21	
MW-6	11/22/04	123.99	4794.45	
MW-6	12/16/04	124.78	4793.66	

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-6	01/11/05	123.6	4794.84	
MW-6	02/16/05	124.65	4793.79	
MW-6	03/14/05	124.35	4794.09	
MW-6	04/12/05	115.02	4803.42	
MW-6	05/17/05	120.92	4797.52	
MW-6	06/15/05	122.18	4796.26	
MW-6	07/21/05	124.06	4794.38	
MW-7-1	01/12/04			Y
MW-7-1	02/16/04			Y
MW-7-1	03/18/04			Y
MW-7-1	04/14/04			Y
MW-7-1	05/18/04			Y
MW-7-1	06/16/04			Y
MW-7-1	07/12/04			Y
MW-7-1	08/23/04			Y
MW-7-1	09/28/04			Y
MW-7-1	10/20/04			Y
MW-7-1	11/23/04			Y
MW-7-1	12/20/04			Y
MW-7-1	01/11/05			Y
MW-7-1	02/15/05			Y
MW-7-1	03/14/05			Y
MW-7-1	04/05/05			Y
MW-7-1	05/17/05			Y
MW-7-1	06/15/05			Y
MW-7-1	07/19/05			Y
MW-7-2	01/12/04	141.02	4778.07	
MW-7-2	02/16/04	140.93	4778.16	
MW-7-2	03/18/04	140.91	4778.18	
MW-7-2	04/14/04	140.82	4778.27	
MW-7-2	05/18/04	140.65	4778.45	
MW-7-2	06/16/04	141.85	4777.28	
MW-7-2	07/12/04	141.11	4778	
MW-7-2	08/23/04	141	4778.12	
MW-7-2	09/28/04			Y
MW-7-2	10/20/04	140.42	4778.67	
MW-7-2	11/23/04	140.43	4778.66	
MW-7-2	12/20/04	140.46	4778.63	
MW-7-2	01/11/05	140.3	4778.79	
MW-7-2	02/08/05	140.43	4778.66	
MW-7-2	03/14/05	140.98	4778.11	
MW-7-2	04/05/05	140.39	4778.7	
MW-7-2	05/17/05	143.4	4775.69	
MW-7-2	06/15/05	140.88	4778.21	

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-7-2	07/19/05	140.45	4778.64	
MW-8	01/12/04			Y
MW-8	02/17/04			Y
MW-8	03/17/04			Y
MW-8	04/14/04			Y
MW-8	05/10/04			Y
MW-8	06/23/04			Y
MW-8	07/12/04			Y
MW-8	08/23/04			Y
MW-8	09/27/04			Y
MW-8	10/20/04			Y
MW-8	11/18/04			Y
MW-8	12/20/04			Y
MW-8	01/17/05			Y
MW-8	02/07/05			Y
MW-8	03/16/05			Y
MW-8	04/05/05			Y
MW-8	05/16/05			Y
MW-8	06/15/05			Y
MW-8	07/18/05			Y
MW-9-1	01/11/04			Y
MW-9-1	02/24/04			Y
MW-9-1	03/18/04			Y
MW-9-1	04/14/04			Y
MW-9-1	05/18/04			Y
MW-9-1	06/16/04			Y
MW-9-1	07/14/04			Y
MW-9-1	08/23/04			Y
MW-9-1	09/29/04			Y
MW-9-1	10/20/04			Y
MW-9-1	11/23/04			Y
MW-9-1	12/20/04			Y
MW-9-1	01/11/05			Y
MW-9-1	02/15/05			Y
MW-9-1	03/14/05			
MW-9-1	04/05/05			Y
MW-9-1	05/17/05			
MW-9-1	06/16/05			
MW-9-1	07/18/05			
MW-9-2	02/24/04	127.82	4790.97	
MW-9-2	03/18/04			Y
MW-9-2	04/14/04	127.71	4791.08	
MW-9-2	05/18/04	128.23	4790.56	
MW-9-2	06/16/04	129	4789.79	

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
MW-9-2	07/14/04	129.24	4789.55	
MW-9-2	08/23/04	129.26	4789.53	
MW-9-2	09/29/04	127.37	4791.42	
MW-9-2	10/20/04	126.63	4792.21	
MW-9-2	11/23/04	126.27	4792.52	
MW-9-2	12/20/04	125.78	4793.06	
MW-9-2	01/11/05	125.46	4793.33	
MW-9-2	02/15/05	126.82	4792.02	
MW-9-2	03/14/05	126.73	4794.76	
MW-9-2	04/05/05	127.03	4794.46	
MW-9-2	05/17/05	127.6	4793.89	
MW-9-2	06/16/05	126.68	4794.81	
MW-9-2	07/18/05	127.69	4793.8	
PP-AL	01/15/04			Y
PP-AL	02/18/04			Y
PP-AL	03/18/04			Y
PP-AL	04/12/04			Y
PP-AL	05/08/04			Y
PP-AL	05/19/04			Y
PP-AL	06/28/04			Y
PP-AL	07/14/04			Y
PP-AL	10/28/04			Y
PP-AL	11/18/04			Y
PP-AL	12/17/04			Y
PP-AL	01/19/05			Y
PP-AL	02/07/05			Y
PP-AL	03/15/05			Y
PP-AL	04/18/05			Y
PP-AL	05/19/05	33.65	4885.73	
PP-AL	06/27/05	34.82	4884.56	
PP-AL	07/21/05			Y
PP-CH-1	01/15/04	197.58	4721.48	
PP-CH-1	02/18/04			Y
PP-CH-1	03/18/04			Y
PP-CH-1	04/12/04			Y
PP-CH-1	05/19/04			Y
PP-CH-1	06/28/04			Y
PP-CH-1	07/14/04			Y
PP-CH-1	08/23/04			Y
PP-CH-1	09/29/04			Y
PP-CH-1	10/28/04			Y
PP-CH-1	11/18/04			Y
PP-CH-1	12/17/04			Y
PP-CH-1	01/17/05			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
PP-CH-1	03/15/05			Y
PP-CH-1	04/18/05			Y
PP-CH-1	05/19/05			Y
PP-CH-1	06/27/05			Y
PP-CH-1	07/21/05			Y
PP-CH-2	01/15/04	243.01	4676.05	
PP-CH-2	02/18/04	243.03	4676.03	
PP-CH-2	03/03/04	242.3	4676.76	
PP-CH-2	03/18/04	242.87	4676.19	
PP-CH-2	04/12/04			Y
PP-CH-2	05/08/04	240.32	4678.74	
PP-CH-2	05/19/04	242.79	4676.29	
PP-CH-2	06/28/04	243.83	4675.24	
PP-CH-2	07/14/04	243.69	4675.41	
PP-CH-2	08/24/04	243.42	4675.65	
PP-CH-2	09/29/04	244	4675.06	
PP-CH-2	10/28/04	243.15	4675.91	
PP-CH-2	11/18/04	244.64	4674.42	
PP-CH-2	12/17/04	245.14	4673.92	
PP-CH-2	01/19/05	245.09	4673.97	
PP-CH-2	01/26/05	245.01	4674.05	
PP-CH-2	03/15/05	244.78	4674.28	
PP-CH-2	04/18/05	244.57	4674.49	
PP-CH-2	05/19/05	244.45	4674.61	
PP-CH-2	06/27/05	244.82	4674.24	
PP-CH-2	07/21/05	245.46	4673.6	
PP-DP-1	01/15/04			Y
PP-DP-1	02/18/04			Y
PP-DP-1	03/18/04			Y
PP-DP-1	04/12/04			Y
PP-DP-1	05/08/04	58.51	4861.16	
PP-DP-1	05/19/04			Y
PP-DP-1	06/28/04			Y
PP-DP-1	07/14/04			Y
PP-DP-1	08/24/04	60.3	4859.39	
PP-DP-1	09/29/04			Y
PP-DP-1	10/28/04	60.03	4859.64	
PP-DP-1	11/18/04			Y
PP-DP-1	12/17/04			Y
PP-DP-1	01/19/05			Y
PP-DP-1	02/16/05	60.05	4859.62	
PP-DP-1	03/15/05	60.02	4859.65	
PP-DP-1	04/18/05	59.99	4859.68	
PP-DP-1	05/19/05	59.84	4859.83	

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
PP-DP-1	06/27/05	58.91	4860.76	
PP-DP-1	07/21/05	58.98	4860.69	
PP-DP-4	01/15/04			Y
PP-DP-4	02/18/04			Y
PP-DP-4	03/18/04			Y
PP-DP-4	04/12/04			Y
PP-DP-4	05/08/04	376.84	4542.83	
PP-DP-4	05/19/04			Y
PP-DP-4	06/28/04			Y
PP-DP-4	07/14/04			Y
PP-DP-4	08/24/04			Y
PP-DP-4	09/29/04			Y
PP-DP-4	10/28/04			Y
PP-DP-4	11/18/04			Y
PP-DP-4	12/17/04			Y
PP-DP-4	01/19/05			Y
PP-DP-4	02/07/05			Y
PP-DP-4	03/15/05			Y
PP-DP-4	04/18/05			Y
PP-DP-4	05/19/05			Y
PP-DP-4	06/27/05			Y
PP-DP-4	07/21/05			Y
PP-SP	01/15/04			Y
PP-SP	02/18/04			Y
PP-SP	03/18/04			Y
PP-SP	05/19/04			Y
PP-SP	06/28/04			Y
PP-SP	07/14/04			Y
PP-SP	08/24/04			Y
PP-SP	09/29/04			Y
PP-SP	10/28/04			Y
PP-SP	11/18/04			Y
PP-SP	12/17/04			Y
PP-SP	01/19/05			Y
PP-SP	02/16/05			Y
PP-SP	03/15/05			Y
PP-SP	04/18/05			Y
PP-SP	05/19/05			Y
PP-SP	06/27/05			Y
PP-SP	07/21/05			Y
PW-1	01/15/04			Y
PW-1	02/24/04			Y
PW-1	03/17/04			Y
PW-1	04/12/04			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
PW-1	05/08/04			Y
PW-1	05/19/04			Y
PW-1	06/07/04			Y
PW-1	07/14/04			Y
PW-1	08/24/04			Y
PW-1	09/29/04			Y
PW-1	10/28/04			Y
PW-1	11/23/04			Y
PW-1	12/17/04			Y
PW-1	01/19/05			Y
PW-1	02/07/05			Y
PW-1	03/15/05			Y
PW-1	04/18/05			Y
PW-1	06/30/05			Y
PW-1	07/21/05			Y
PW-2	01/15/04			Y
PW-2	02/24/04			Y
PW-2	03/18/04			Y
PW-2	04/12/04			Y
PW-2	05/08/04			Y
PW-2	05/19/04			Y
PW-2	06/28/04			Y
PW-2	07/14/04			Y
PW-2	08/24/04			Y
PW-2	09/29/04			Y
PW-2	10/28/04			Y
PW-2	11/23/04			Y
PW-2	12/17/04			Y
PW-2	01/19/05			Y
PW-2	02/07/05			Y
PW-2	03/15/05			Y
PW-2	04/18/05			Y
PW-2	05/19/05			Y
PW-2	06/27/05			Y
PW-2	07/21/05			Y
PW-3	01/15/04			Y
PW-3	02/18/04			Y
PW-3	03/18/04			Y
PW-3	04/12/04			Y
PW-3	05/19/04			Y
PW-3	06/28/04			Y
PW-3	07/14/04			Y
PW-3	08/24/04			Y
PW-3	09/29/04			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
PW-3	10/28/04			Y
PW-3	11/18/04			Y
PW-3	12/17/04			Y
PW-3	01/19/05			Y
PW-3	02/07/05			Y
PW-3	03/15/05			Y
PW-3	04/18/05			Y
PW-3	05/19/05			Y
PW-3	06/27/05			Y
PW-3	07/21/05			Y
PW-4	01/15/04	123.19	4793.37	
PW-4	02/24/04	123.44	4793.12	
PW-4	03/18/04	123.61	4792.95	
PW-4	04/12/04	123.87	4792.69	
PW-4	05/08/04	120.55	4796.01	
PW-4	05/19/04	124.12	4792.49	
PW-4	06/28/04	124.42	4792.14	
PW-4	07/14/04	124.53	4792.08	
PW-4	08/24/04	124.85	4791.76	
PW-4	09/29/04	124.95	4791.61	
PW-4	10/28/04	125.29	4791.27	
PW-4	11/23/04	125.33	4791.23	
PW-4	12/17/04	125.27	4791.29	
PW-4	01/19/05	125.17	4791.39	
PW-4	01/26/05	125.18	4791.38	
PW-4	02/07/05	125.15	4791.41	
PW-4	03/15/05	125.25	4791.31	
PW-4	04/18/05	125.12	4791.44	
PW-4	05/19/05	125.23	4791.33	
PW-4	06/27/05	97.08	4819.48	
PW-4	07/21/05	110.89	4805.67	
PW-5	01/14/04			Y
PW-5	02/18/04			Y
PW-5	03/17/04			Y
PW-5	04/12/04			Y
PW-5	05/18/04			Y
PW-5	06/07/04			Y
PW-5	07/14/04			Y
PW-5	08/24/04			Y
PW-5	10/28/04			Y
PW-5	11/18/04			Y
PW-5	01/19/05			Y
PW-5	02/16/05			Y
PW-5	03/16/05			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
PW-5	04/18/05			Y
PW-5	05/19/05			Y
PW-5	06/27/05			Y
PW-5	07/21/05			Y
PW-6	01/15/04			Y
PW-6	02/24/04			Y
PW-6	03/17/04			Y
PW-6	04/12/04			Y
PW-6	05/19/04			Y
PW-6	06/07/04			Y
PW-6	07/14/04			Y
PW-6	08/24/04			Y
PW-6	09/29/04			Y
PW-6	10/28/04			Y
PW-6	11/17/04			Y
PW-6	12/20/04			Y
PW-6	01/19/05			Y
PW-6	02/16/05			Y
PW-6	03/15/05			Y
PW-6	04/13/05			Y
PW-6	05/19/05			Y
PW-6	06/16/05			Y
PW-6	07/21/05			Y
PW-6	08/01/05			Y
STL-AL	01/14/04			Y
STL-AL	02/16/04			Y
STL-AL	03/18/04			Y
STL-AL	04/12/04			Y
STL-AL	05/18/04			Y
STL-AL	06/23/04			Y
STL-AL	07/14/04			Y
STL-AL	08/24/04			Y
STL-AL	09/28/04			Y
STL-AL	10/20/04			Y
STL-AL	11/22/04			Y
STL-AL	12/16/04			Y
STL-AL	01/18/05			Y
STL-AL	02/07/05			Y
STL-AL	03/14/05			Y
STL-AL	04/05/05			Y
STL-AL	05/17/05			Y
STL-AL	06/15/05			Y
STL-AL	07/19/05			Y
STL-CH-1	01/14/04			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
STL-CH-1	02/16/04			Y
STL-CH-1	03/18/04			Y
STL-CH-1	04/12/04			Y
STL-CH-1	05/18/04			Y
STL-CH-1	06/23/04	110.69	4801.59	
STL-CH-1	07/14/04			Y
STL-CH-1	08/24/04			Y
STL-CH-1	09/28/04			Y
STL-CH-1	10/20/04	110.57	4801.72	
STL-CH-1	11/22/04			Y
STL-CH-1	12/16/04			Y
STL-CH-1	01/18/05			Y
STL-CH-1	02/07/05			Y
STL-CH-1	02/15/05			Y
STL-CH-1	03/14/05			Y
STL-CH-1	04/05/05			Y
STL-CH-1	05/17/05	110.6	4801.69	
STL-CH-1	06/15/05	110.51	4801.78	
STL-CH-1	07/19/05	110.46	4801.83	
STL-CH-2	01/14/04			Y
STL-CH-2	02/16/04			Y
STL-CH-2	03/18/04			Y
STL-CH-2	04/12/04			Y
STL-CH-2	05/18/04			Y
STL-CH-2	06/23/04			Y
STL-CH-2	07/14/04			Y
STL-CH-2	08/24/04			Y
STL-CH-2	09/28/04			Y
STL-CH-2	10/20/04			Y
STL-CH-2	11/22/04			Y
STL-CH-2	12/16/04			Y
STL-CH-2	01/18/05			Y
STL-CH-2	02/07/05			Y
STL-CH-2	02/15/05			Y
STL-CH-2	03/14/05			Y
STL-CH-2	04/05/05			Y
STL-CH-2	05/17/05			Y
STL-CH-2	06/15/05			Y
STL-CH-2	07/19/05			Y
STL-DP	01/14/04			Y
STL-DP	02/16/04			Y
STL-DP	03/18/04			Y
STL-DP	04/12/04			Y
STL-DP	05/18/04	459.26	4452.9	
STL-DP	06/23/04			Y
STL-DP	07/14/04			Y
STL-DP	08/24/04			Y
STL-DP	09/28/04			Y
STL-DP	10/20/04	438.87	4473.27	
STL-DP	11/22/04			Y
STL-DP	12/16/04			Y
STL-DP	01/18/05			Y
STL-DP	02/07/05			Y
STL-DP	03/14/05			Y
STL-DP	04/05/05	439.71	4472.43	
STL-DP	05/17/05			Y
STL-DP	06/15/05	439.69	4472.45	
STL-DP	07/19/05			Y
TF-AL	01/14/04			Y
TF-AL	02/16/04			Y
TF-AL	03/17/04			Y
TF-AL	04/12/04			Y
TF-AL	05/18/04			Y
TF-AL	06/10/04			Y
TF-AL	07/14/04			Y
TF-AL	08/24/04			Y
TF-AL	09/28/04			Y
TF-AL	11/22/04			Y
TF-AL	12/16/04			Y
TF-AL	01/18/05			Y
TF-AL	02/07/05			Y
TF-AL	03/14/05			Y
TF-AL	04/05/05			Y
TF-AL	05/17/05			Y
TF-AL	06/15/05			Y
TF-AL	07/19/05			Y
TF-CH	01/14/04	147.28	4767.69	
TF-CH	02/16/04	146.78	4768.19	
TF-CH	04/12/04	146.36	4768.61	
TF-CH	05/18/04	146.05	4768.91	
TF-CH	06/10/04	146.07	4768.89	
TF-CH	07/14/04	147.65	4767.31	
TF-CH	08/24/04	146.19	4768.78	
TF-CH	09/28/04	146.25	4768.72	
TF-CH	10/28/04	146.68	4768.29	
TF-CH	11/22/04	145.79	4769.18	
TF-CH	12/16/04	147.29	4767.68	
TF-CH	01/18/05	145.56	4769.41	
TF-CH	02/08/05	145.28	4769.69	
TF-CH	03/14/05	144.94	4770.03	
TF-CH	04/05/05	145.48	4769.49	
TF-CH	05/17/05	145.11	4769.86	
TF-CH	06/15/05	145.16	4769.81	
TF-CH	07/19/05	145.12	4769.85	
TF-DP-1	05/18/04			Y
TF-DP-1	06/10/04			Y
TF-DP-1	07/14/04			Y
TF-DP-1	08/24/04			Y
TF-DP-1	09/28/04			Y
TF-DP-1	10/28/04			Y
TF-DP-1	11/22/04			Y
TF-DP-1	12/16/04			Y
TF-DP-1	01/18/05			Y
TF-DP-1	03/14/05			
TF-DP-4	01/14/04			Y
TF-DP-4	02/16/04			Y
TF-DP-4	03/17/04			Y
TF-DP-4	04/12/04			Y
TF-DP-4	05/18/04			Y
TF-DP-4	06/10/04			Y
TF-DP-4	07/14/04			Y
TF-DP-4	08/24/04			Y
TF-DP-4	09/28/04			Y
TF-DP-4	10/28/04			Y
TF-DP-4	11/22/04			Y
TF-DP-4	12/16/04			Y
TF-DP-4	01/18/05			Y
TF-DP-4	02/07/05			Y
TF-DP-4	03/14/05			Y
TF-DP-4	04/05/05			Y
TF-DP-4	05/17/05			Y
TF-DP-4	06/15/05			Y
TF-DP-4	07/19/05			Y
ICPP-2020	04/12/05	417.74		
ICPP-2020	05/17/05	417.46		
ICPP-2020	06/16/05	417.47		
ICPP-2020	07/18/05	417.46		
ICPP-2021	04/12/05	394.31		
ICPP-2021	05/16/05	394.03		
ICPP-2021	06/15/05	394.03		
ICPP-2021	07/18/05	394.04		
ICPP-2019	04/12/05	106.55	4808.11	

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
ICPP-2019	05/16/05	106.82	4807.84	
ICPP-2019	06/15/05	106.37	4808.29	
ICPP-2019	07/18/05	107.2	4807.46	
TF-SP	01/14/04	156.39	4758.42	
TF-SP	02/16/04	156.28	4758.53	
TF-SP	03/17/04	146.34	4768.47	
TF-SP	04/12/04	156.15	4758.66	
TF-SP	05/18/04	155.97	4758.84	
TF-SP	06/10/04	155.95	4759.86	
TF-SP	07/14/04	156.38	4758.44	
TF-SP	08/24/04	156.21	4758.61	
TF-SP	09/28/04	156.05	4758.76	
TF-SP	10/28/04	155.48	4759.33	
TF-SP	11/22/04	155.52	4759.29	
TF-SP	12/16/04	155.82	4758.99	
TF-SP	01/18/05	155.29	4759.52	
TF-SP	02/07/05			
TF-SP	02/15/05	150.66	4764.15	
TF-SP	03/14/05	151.86	4762.95	
TF-SP	04/05/05	152.13	4762.68	
TF-SP	05/17/05	152.75	4762.06	
TF-SP	06/15/05	152.2	4762.61	
TF-SP	07/19/05	152.91	4761.9	
ICPP-2018	05/16/05	109.27	4806.6	
ICPP-2018	06/16/05	107.96	4807.9	
ICPP-2018	07/18/05	108.57	4807.3	
USGS-50	01/12/04	382.79	4534.02	
USGS-50	03/17/04	382.2	4534.61	
USGS-50	04/12/04	382.07	4534.74	
USGS-50	05/10/04	380.12	4536.688	
USGS-50	06/07/04	380.91	4535.888	
USGS-50	07/21/04	382.16	4534.668	
USGS-50	08/23/04	386.61	4530.188	
USGS-50	09/27/04	382.94	4533.87	
USGS-50	10/25/04	382.61	4534.2	
USGS-50	11/22/04	383.85	4532.96	
USGS-50	12/20/04	384.53	4532.98	
USGS-50	01/12/05	383.68	4533.13	
USGS-50	03/14/05	384.82	4532.7	
USGS-50	04/12/05	384.71	4532.8	
USGS-50	05/16/05	384.56	4532.95	
USGS-50	06/15/05	385.17	4532.34	
USGS-50	07/21/05	385.48	4532.03	
ICPP-1781L	02/24/04			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
ICPP-1781L	03/29/04			Y
ICPP-1781L	04/12/04			Y
ICPP-1781L	05/24/04			Y
ICPP-1781L	06/07/04			Y
ICPP-1781L	07/14/04			Y
ICPP-1781L	08/24/04			Y
ICPP-1781L	09/29/04			Y
ICPP-1781L	10/28/04			Y
ICPP-1781L	11/30/04			Y
ICPP-1781L	12/17/04			Y
ICPP-1781L	01/19/05	398.87	4527.12	
ICPP-1781L	02/16/05	398.61	4527.38	
ICPP-1781L	03/15/05	398.61	4527.38	
ICPP-1781L	04/18/05	398.64	4527.35	
ICPP-1781L	05/19/05	398.69	4527.3	
ICPP-1781L	06/01/05	398.75	4527.24	
ICPP-1781L	06/01/05	398.75	4527.24	
ICPP-1781L	06/30/05	398.77	4527.22	
ICPP-1781L	07/21/05	398.76	4527.23	
ICPP-1781L	08/01/05	398.79	4527.2	
ICPP-1781M	03/29/04			Y
ICPP-1781M	04/12/04			Y
ICPP-1781M	05/24/04			Y
ICPP-1781M	06/07/04			Y
ICPP-1781M	07/14/04			Y
ICPP-1781M	08/24/04			Y
ICPP-1781M	09/29/04			Y
ICPP-1781M	10/28/04			Y
ICPP-1781M	11/30/04			Y
ICPP-1781M	12/17/04			Y
ICPP-1781M	01/19/05			Y
ICPP-1781M	02/16/05			Y
ICPP-1781M	03/15/05			Y
ICPP-1781M	04/18/05			Y
ICPP-1781M	05/19/05			Y
ICPP-1781M	06/01/05			Y
ICPP-1781M	06/30/05			Y
ICPP-1781M	07/21/05			Y
ICPP-1781M	08/01/05			Y
ICPP-1781U	03/29/04			Y
ICPP-1781U	04/12/04			Y
ICPP-1781U	05/24/04			Y
ICPP-1781U	06/07/04			Y
ICPP-1781U	07/14/04			Y

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
ICPP-1781U	08/24/04			Y
ICPP-1781U	09/29/04			Y
ICPP-1781U	10/28/04			Y
ICPP-1781U	11/30/04			Y
ICPP-1781U	12/17/04			Y
ICPP-1781U	01/19/05			Y
ICPP-1781U	02/16/05			Y
ICPP-1781U	03/15/05			Y
ICPP-1781U	04/18/05			Y
ICPP-1781U	05/19/05			Y
ICPP-1781U	06/01/05			Y
ICPP-1781U	06/30/05			Y
ICPP-1781U	07/21/05			Y
ICPP-1781U	08/01/05			Y
ICPP-1801M	02/24/04			Y
ICPP-1801M	03/29/04			Y
ICPP-1801M	04/12/04			Y
ICPP-1801M	05/19/04			Y
ICPP-1801M	06/07/04			Y
ICPP-1801M	07/14/04			Y
ICPP-1801M	08/24/04			Y
ICPP-1801M	09/30/04			Y
ICPP-1801M	10/28/04			Y
ICPP-1801M	11/30/04			Y
ICPP-1801M	12/17/04			Y
ICPP-1801M	01/19/05			Y
ICPP-1801M	02/16/05			Y
ICPP-1801M	03/15/05			Y
ICPP-1801M	04/18/05			Y
ICPP-1801M	05/19/05			Y
ICPP-1801M	06/30/05			Y
ICPP-1801M	07/21/05			Y
ICPP-1801U	02/24/04			Y
ICPP-1801U	03/29/04			Y
ICPP-1801U	04/12/04			Y
ICPP-1801U	05/19/04			Y
ICPP-1801U	06/07/04			Y
ICPP-1801U	07/14/04			Y
ICPP-1801U	08/24/04			Y
ICPP-1801U	09/30/04			Y
ICPP-1801U	10/28/04			Y
ICPP-1801U	11/30/04			Y
ICPP-1801U	12/17/04			Y
ICPP-1801U	01/19/05			Y

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
ICPP-1801U	02/16/05			Y
ICPP-1801U	03/15/05			Y
ICPP-1801U	04/18/05			Y
ICPP-1801U	05/19/05			Y
ICPP-1801U	06/30/05			Y
ICPP-1801U	07/21/05			Y
ICPP-1802L	02/24/04	381.37	4543.75	
ICPP-1802L	03/17/04	381.42	4543.7	
ICPP-1802L	04/12/04	382.17	4542.95	
ICPP-1802L	05/19/04	381.45	4543.66	
ICPP-1802L	06/07/04	381.2	4543.91	
ICPP-1802L	07/14/04	381.88	4543.23	
ICPP-1802L	08/24/04	381.87	4540.92	
ICPP-1802L	09/29/04	381.21	4543.91	
ICPP-1802L	10/28/04	381.36	4543.76	
ICPP-1802L	11/17/04	381.67	4543.45	
ICPP-1802L	12/20/04	381.98	4543.14	
ICPP-1802L	01/19/05	382.07	4543.05	
ICPP-1802L	02/16/05	381.92	4543.2	
ICPP-1802L	03/15/05	380.76	4544.36	
ICPP-1802L	04/13/05	380.55	4544.57	
ICPP-1802L	05/19/05	380.69	4544.43	
ICPP-1802L	06/01/05	380.24	4544.88	
ICPP-1802L	06/16/05	381.75	4543.37	
ICPP-1802L	07/21/05	381.47	4543.65	
ICPP-1802L	08/01/05	382.92	4542.2	
ICPP-1802U	03/17/04			Y
ICPP-1802U	04/12/04			Y
ICPP-1802U	05/19/04			Y
ICPP-1802U	06/07/04			Y
ICPP-1802U	07/14/04			Y
ICPP-1802U	08/24/04			Y
ICPP-1802U	09/29/04			Y
ICPP-1802U	11/17/04			Y
ICPP-1802U	12/20/04			Y
ICPP-1802U	01/19/05			Y
ICPP-1802U	02/16/05			Y
ICPP-1802U	03/15/05			Y
ICPP-1802U	04/13/05			Y
ICPP-1802U	05/19/05			Y
ICPP-1802U	06/01/05			Y
ICPP-1802U	06/16/05			Y
ICPP-1802U	08/01/05			Y
ICPP-1803L	02/24/04			Y
INTEC Perched Monitoring Wells				
ICPP-1803L	03/17/04			Y
ICPP-1803L	04/12/04			Y
ICPP-1803L	05/19/04			Y
ICPP-1803L	06/07/04			Y
ICPP-1803L	07/14/04			Y
ICPP-1803L	08/24/04			Y
ICPP-1803L	09/29/04			Y
ICPP-1803L	10/28/04			Y
ICPP-1803L	11/17/04			Y
ICPP-1803L	12/20/04			Y
ICPP-1803L	01/19/05			Y
ICPP-1803L	02/16/05			Y
ICPP-1803L	03/15/05			Y
ICPP-1803L	04/13/05			Y
ICPP-1803L	05/19/05			Y
ICPP-1803L	06/16/05			Y
ICPP-1803L	07/21/05			Y
ICPP-1803L	08/01/05			Y
ICPP-1803M	02/24/04			Y
ICPP-1803M	03/17/04			Y
ICPP-1803M	04/12/04			Y
ICPP-1803M	05/19/04			Y
ICPP-1803M	06/07/04			Y
ICPP-1803M	07/14/04			Y
ICPP-1803M	08/24/04			Y
ICPP-1803M	09/29/04			Y
ICPP-1803M	10/28/04			Y
ICPP-1803M	11/17/04			Y
ICPP-1803M	12/20/04			Y
ICPP-1803M	01/19/05			Y
ICPP-1803M	02/16/05			Y
ICPP-1803M	03/15/05			Y
ICPP-1803M	04/13/05			Y
ICPP-1803M	05/19/05			Y
ICPP-1803M	06/16/05			Y
ICPP-1803M	07/21/05			Y
ICPP-1803M	07/21/05			Y
ICPP-1803M	08/01/05			Y
ICPP-1803U	02/24/04			Y
ICPP-1803U	03/17/04			Y
ICPP-1803U	04/12/04			Y
ICPP-1803U	05/19/04			Y
ICPP-1803U	06/07/04			Y
ICPP-1803U	07/14/04			Y
INTEC Perched Monitoring Wells				
ICPP-1803U	08/24/04			Y
ICPP-1803U	09/29/04			Y
ICPP-1803U	10/28/04			Y
ICPP-1803U	11/17/04			Y
ICPP-1803U	12/20/04			Y
ICPP-1803U	01/19/05			Y
ICPP-1803U	02/16/05			Y
ICPP-1803U	03/15/05			Y
ICPP-1803U	04/13/05			Y
ICPP-1803U	05/19/05			Y
ICPP-1803U	06/16/05			Y
ICPP-1803U	07/21/05			Y
ICPP-1803U	08/01/05			Y
ICPP-1804L	02/24/04	353.71	4567.25	
ICPP-1804L	03/03/04	353.96	4567	
ICPP-1804L	03/29/04	354.88	4566.08	
ICPP-1804L	04/12/04	355.05	4565.91	
ICPP-1804L	05/19/04	355.39	4565.615	
ICPP-1804L	06/07/04	355.63	4565.37	
ICPP-1804L	07/14/04	356.87	4564.13	
ICPP-1804L	08/24/04	357.75	4562.19	
ICPP-1804L	09/29/04	359.02	4561.94	
ICPP-1804L	10/28/04	369.6	4551.36	
ICPP-1804L	11/23/04	364.56	4556.4	
ICPP-1804L	12/17/04	366.53	4554.43	
ICPP-1804L	01/19/05	367.51	4553.45	
ICPP-1804L	02/16/05	368.07	4552.89	
ICPP-1804L	03/15/05	369	4551.96	
ICPP-1804L	03/16/05	368.76	4552.2	
ICPP-1804L	04/18/05	364.16	4556.8	
ICPP-1804L	05/19/05	369.42	4551.54	
ICPP-1804L	06/30/05	371.82	4549.14	
ICPP-1804L	07/21/05	372.16	4548.8	
ICPP-1804M	02/24/04	268.29	4652.67	
ICPP-1804M	03/29/04	268.27	4652.69	
ICPP-1804M	04/12/04	268.31	4652.65	
ICPP-1804M	05/19/04	268.11	4652.895	
ICPP-1804M	06/07/04	268.12	4652.88	
ICPP-1804M	07/14/04	268.16	4652.84	
ICPP-1804M	08/24/04	268.36	4652.63	
ICPP-1804M	09/29/04	168.35	4752.61	
ICPP-1804M	10/28/04	268.15	4652.81	
ICPP-1804M	11/23/04	268.15	4652.81	
ICPP-1804M	12/17/04	268.15	4652.81	

Table B-5. (continued).

Location	Date Measured	Depth to Water (ft BMP)	Water Level Elevation (ft asl)	Dry?
INTEC Perched Monitoring Wells				
ICPP-1804M	01/19/05	268.18	4652.78	
ICPP-1804M	02/16/05			Y
ICPP-1804M	03/15/05			Y
ICPP-1804M	04/18/05			Y
ICPP-1804M	05/19/05			Y
ICPP-1804M	06/30/05			Y
ICPP-1804M	07/21/05			Y
ICPP-1807L	02/24/04			Y
ICPP-1807L	03/29/04			Y
ICPP-1807L	04/12/04			Y
ICPP-1807L	05/19/04			Y
ICPP-1807L	06/07/04			Y
ICPP-1807L	07/14/04			Y
ICPP-1807L	08/24/04			Y
ICPP-1807L	09/30/04			Y
ICPP-1807L	10/28/04			Y
ICPP-1807L	11/30/04			Y
ICPP-1807L	12/17/04			Y
ICPP-1807L	01/19/05			Y
ICPP-1807L	02/16/05			Y
ICPP-1807L	03/15/05			Y
ICPP-1807L	04/18/05			Y
ICPP-1807L	05/19/05			Y
ICPP-1807L	06/30/05			Y
ICPP-1807L	07/21/05			Y
ICPP-1807M	02/24/04			Y
ICPP-1807M	03/29/04			Y
ICPP-1807M	04/12/04			Y
ICPP-1807M	05/19/04			Y
ICPP-1807M	06/07/04			Y
ICPP-1807M	07/14/04			Y
INTEC Perched Monitoring Wells				
ICPP-1807M	08/24/04			Y
ICPP-1807M	09/30/04			Y
ICPP-1807M	10/28/04			Y
ICPP-1807M	11/30/04			Y
ICPP-1807M	12/17/04			Y
ICPP-1807M	01/19/05			Y
ICPP-1807M	02/16/05			Y
ICPP-1807M	03/15/05			Y
ICPP-1807M	04/18/05			Y
ICPP-1807M	05/19/05			Y
ICPP-1807M	06/30/05			Y
ICPP-1807M	07/21/05			Y
ICPP-1807U	02/24/04			Y
ICPP-1807U	03/29/04			Y
ICPP-1807U	04/12/04			Y
ICPP-1807U	05/19/04			Y
ICPP-1807U	06/07/04			Y
ICPP-1807U	07/14/04			Y
ICPP-1807U	08/24/04			Y
ICPP-1807U	09/30/04			Y
ICPP-1807U	10/28/04			Y
ICPP-1807U	11/30/04			Y
ICPP-1807U	12/17/04			Y
ICPP-1807U	01/19/05			Y
ICPP-1807U	02/16/05			Y
ICPP-1807U	03/15/05			Y
ICPP-1807U	04/18/05			Y
ICPP-1807U	05/19/05			Y
ICPP-1807U	06/30/05			Y
ICPP-1807U	07/21/05			Y

Appendix C

Evaluation of Factors Affecting Perched Water Levels at INTEC

Appendix C

Evaluation of Factors Affecting Perched Water Levels at INTEC

C-1. INTRODUCTION

One means of minimizing transport of contaminants from perched water at the INTEC facility to the Snake River Plain Aquifer is to minimize recharge to the perched water units. One of the difficulties in doing that is that several potential sources of recharge exist and, to date, the relative contributions of those sources to each of the perched water bodies are not well quantified. This study attempted to identify the primary sources of recharge to perched water bodies in the northern part of the facility by comparing time series of water level variations to several indicators of potential recharge, including precipitation, snowmelt, discharge in the Big Lost River (BLR). In addition, the study defined a 'relative wetness' parameter aimed at better quantifying the potential for infiltration of meteoric water to produce recharge. Because there are more perched wells completed in the upper shallow perched water unit than in the lower shallow perched unit, most of this report is a detailed analysis of the shape of the upper shallow unit over time.

C-2. MONITORING WELL DATA FOR THE UPPER SHALLOW PERCHED UNIT

The behavior of the upper shallow perched unit is primarily known from piezometer wells installed just above or in the 110-ft interbed. In many of those wells, relatively long time series exist that document large and often rapid changes in water level (Figure C-1). Data from these wells (Table C-1) can be divided into three distinct time periods because of two significant gaps in the monitoring record. Near-continuous data logger records illustrating significant water level changes are available from four to six wells for the period from 1993 to fall 1995 and from seven wells for the period from summer 1996 to fall 2000. A third period, with continuous or regular periodic monitoring showing significant water level variations in six wells began in approximately November 2002 and continues through the present. For each of these time intervals, additional data describing the extent of the perched unit are available from wells that are continuously or periodically monitored but are routinely dry. For these wells, we assume that the water level is coincident with the top of the sedimentary interbed.

In comparing water levels from these time intervals, we caution that differnces in reference datums or other factors may have occurred that are not appropriately reflected in the long-term record. For instance, a significant offset occurs in several wells between the end of the 1996-2000 monitoring period and the restart of monitoring in 2001. At that time, a ~3-, to 5-ft water level decrease appears to occur in wells 33-2, 37-4, MW-5-2, and MW-6. As all but the latest period of data have been obtained from records with inadequate metadata, it is possible that some of these changes reflect differences in the reference datum. There is also a great difference in the behavior of well 33-4-1 between the current monitoring period (after 2001) and the previous monitoring periods. Prior to 2001, the water level appeared to have a limiting lower value of ~4810 ft. Since the beginning of 2003, the water level has been relatively steady at ~4815 ft, with only one significant dip. This may be explained by an obstruction lodged in the well during a dye tracing test in 2002. In 2003, an attempt to remove the obstruction was partially successful. An irretrievable part of the obstruction was pushed to about 10-ft below the top of the well screen. For this reason, the post-2003 data may not be comparable to the previous monitoring periods.

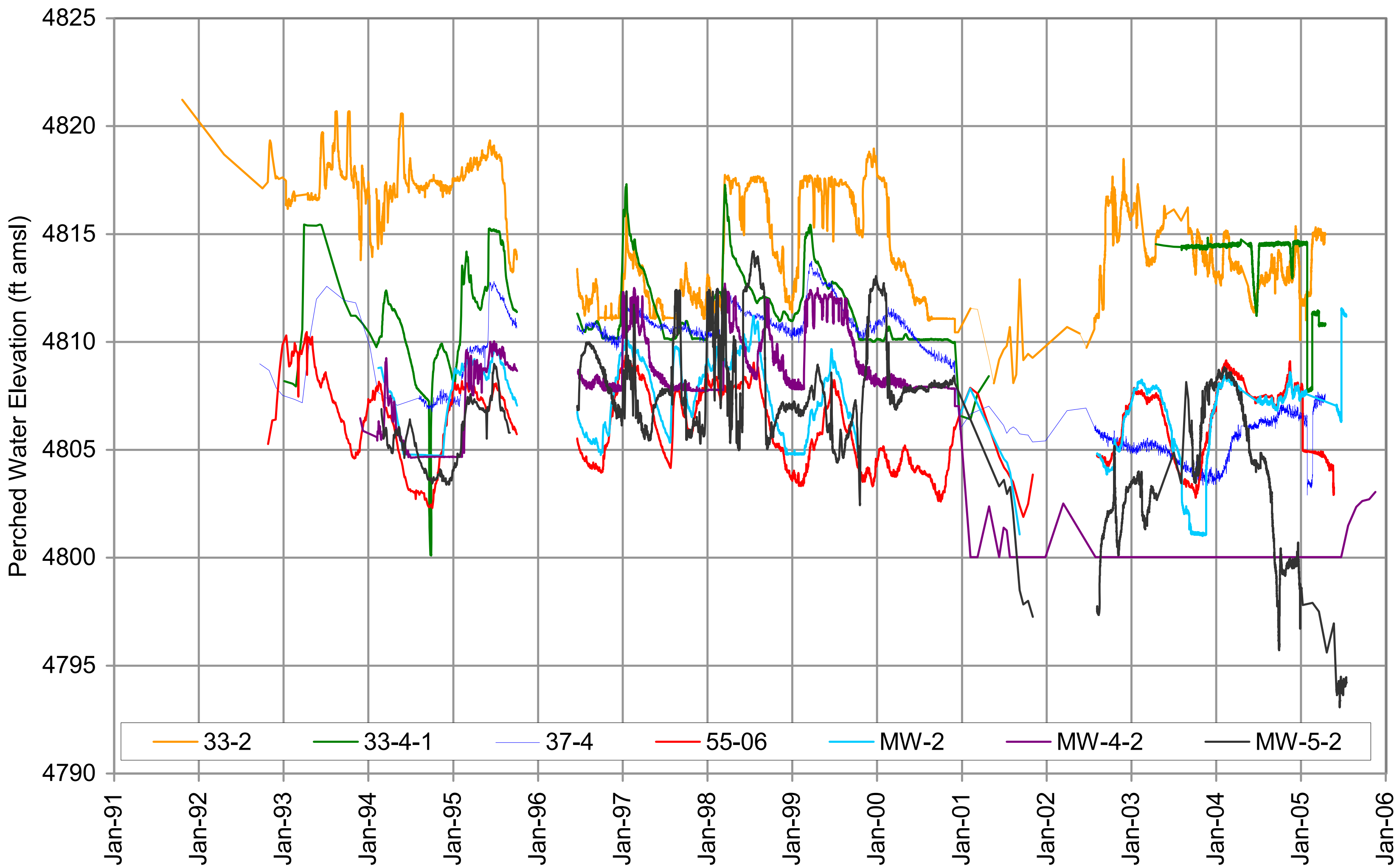

Figure C-1. Water level records of wells in the upper shallow perched water unit.

Table C-1. List of wells that monitor the upper shallow perched water unit. § indicates well has been dry; corresponding elevation represents the top of the 110-ft sedimentary interbed.

Monitoring well	Screened Interval (ft bgs)	Data from 1996-2000	Data from 2000-Present
33-2	86-106	Data logger	Data logger
33-4-1	98-118	Data logger	Data logger
37-4	100-110	Data logger	Data logger
55-06	93-113	Data logger	Data logger
MW-2	102-112	Data logger	Data logger
MW-3-1	116-118	4797 ft§	4797 ft§
MW-4-2	100-110	Data logger	4786 ft
MW-5-2	106-126	Data logger	Data logger
MW-8	115-125	4785 ft§	4785 ft§
MW-11	112-114	4792 ft§	4792 ft§

C-3. CALCULATED VOLUME CHANGES

Water level data from the upper shallow perched water units reflect significant changes in storage over time. To examine those changes and their area-integrated effect, we first estimated the volume of water stored in the upper shallow perched unit over time by spatial interpolation between the measurement points at multiple times. We then calculated the area-integrated changes in storage over time from that spatially interpolated surface data. The area-integrated volume vs time record was then compared to a variety of other records of potential infiltration sources (e.g., daily precipitation, flow in the BLR) to attempt to identify the primary sources of recharge. In this analysis, the extent of the perched water unit was assumed to be limited to the area bounded by the set of wells for which long-term water level data were available (Figure C-2). Water levels within that area were calculated using a bicubic interpolation scheme, in which a piecewise bicubic surface is fit through the existing data points. The value of an interpolated point is thus a combination of the values of the 16 closest points. The volume of water contained within each cell on the gridded domain (horizontal width = length = 30 ft) was calculated assuming that the bottom of the saturated layer coincided with the bottom of the relevant interbed and that the water levels exceeding the thickness of that interbed represented saturated basalt. Interbed and basalt porosities were assumed to be 0.5 and 0.05, respectively. The top and bottom elevations of the 110-ft interbed were determined by geostatistical analysis of the borehole data (DOE-NE-ID 2005, Appendix C). In some cases, records included wells that were dry or nearly dry for long periods of time. Assuming that the perched layer extends beyond the selected domain, water levels in those wells were assumed to coincide with the top of the interbed. Examples of the interpolated surfaces, depicted as potentiometric surface contours, are shown as Figures C-3 and C-5 for the 1996-2000 and 2003-2005 periods, respectively.

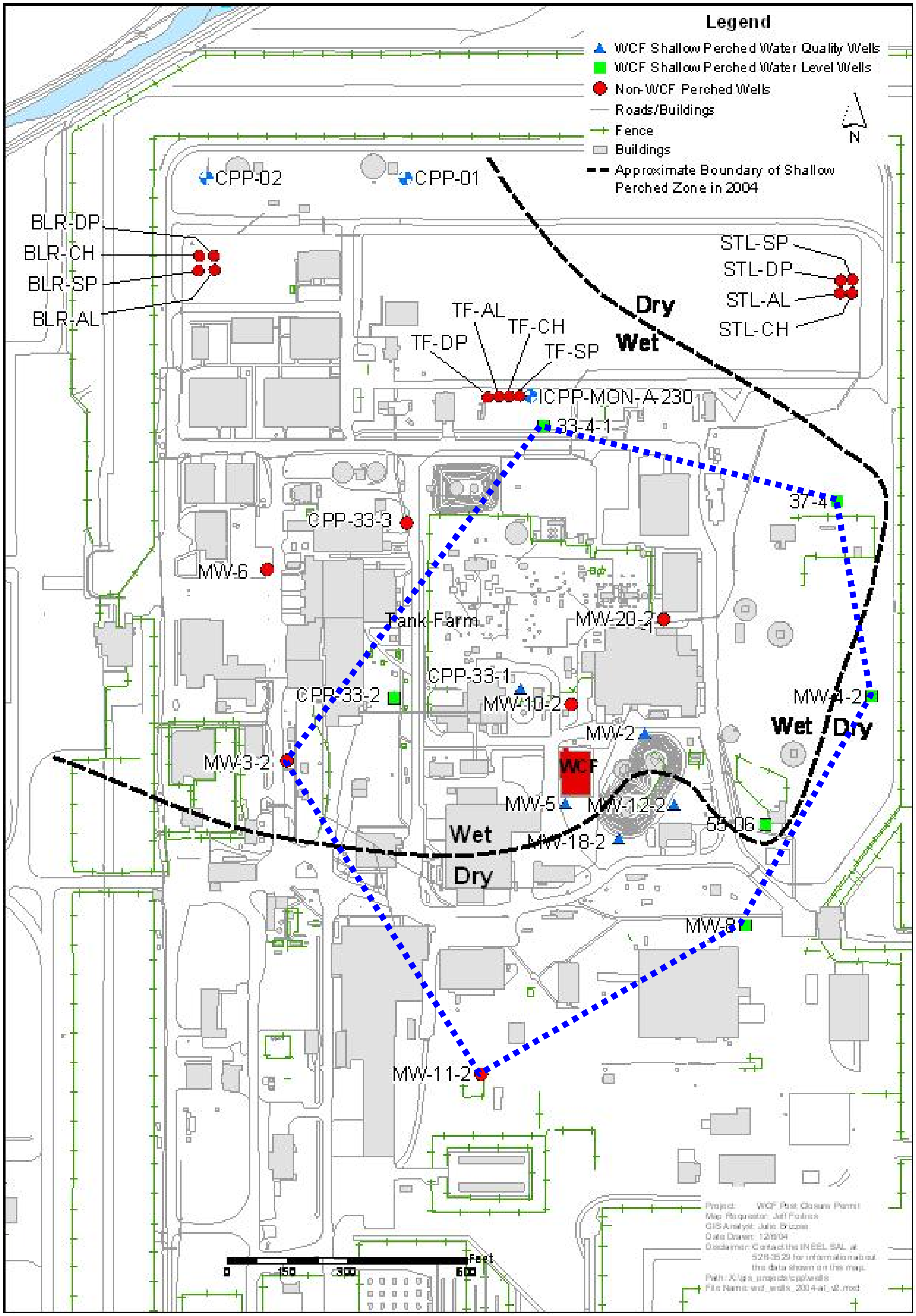

Figure C-2. Extent of area used for storage analysis of the upper shallow perched water unit (dashed line).

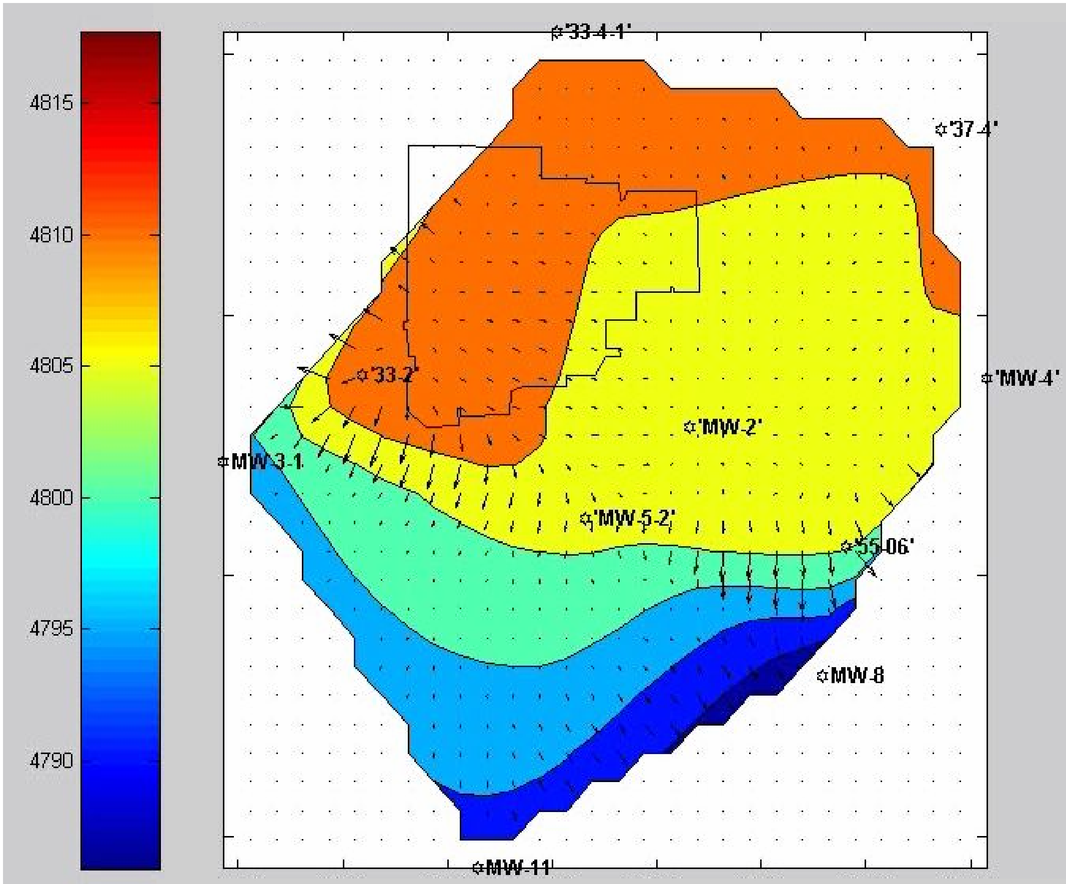

Figure C-3. Snapshot of the interpolated potentiometric surface of the upper shallow perched unit at the start of the 1996-2000 monitoring period. Color scale represents elevation above mean sea level in feet. Inset polygon shows the outline of the tank farm.

Because water levels fluctuate significantly in many wells in the upper shallow perched unit, the interpolated surfaces (e.g., Figures C-3 and C-4) change height and shape over time. These changes are not reflected in the area-integrated volume of water estimated for the perched layer, but the shifting pattern of the water table surface may provide insight about the source and mechanism of recharge and discharge not evident from the time series of net volume changes. The time series of water level maps used to estimate the area-integrated perched water volumes used MATLAB software to perform the calculations.

It should be noted that while this study treats the upper shallow perched water unit as a coherent hydrostratigraphic unit, there is some evidence, including hydrogeochemical data presented in EDF-5758, that different wells in the upper shallow perched unit respond to different forcings. Significant differences also exist between well hydrographs in the upper shallow perched water unit, and in some cases these differences are difficult to interpret as simple flow-delayed response to the same recharge mechanisms. The analyses presented here do not address these issues and should not be interpreted as an argument that the observed perched water levels are sufficient to describe flow in the entire system. Rather, this study takes a simpler view of the perched water unit in order to determine what the overall perched water response pattern may imply about net recharge to the system and its likely sources. For that reason, it is reasonable to assume that the water table surface may be interpolated from the few data points available and that volume estimates based on those surfaces are at least broadly representative of changes in the stored water volume in the perched zones.

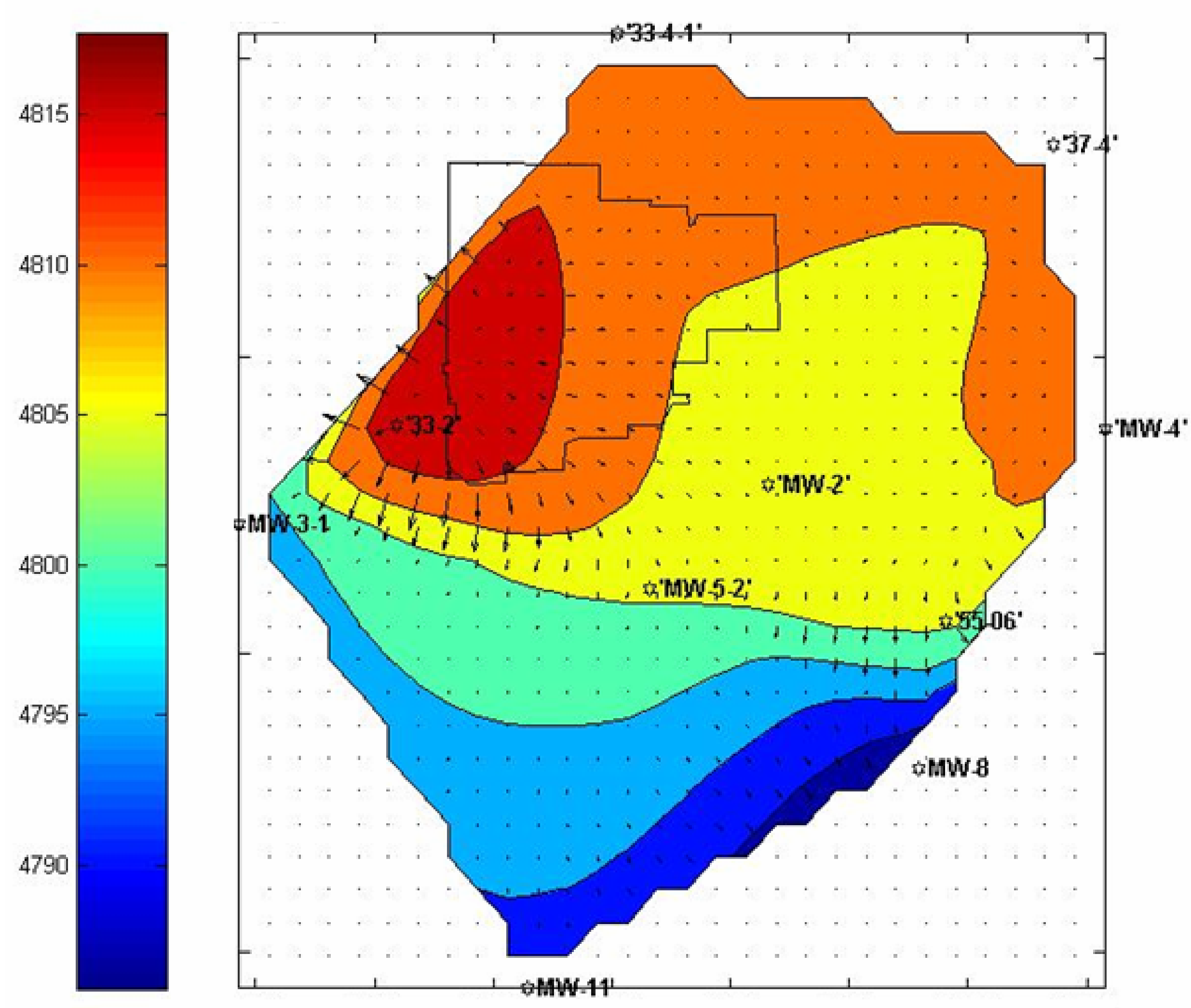

Figure C-4. Snapshot of the interpolated potentiometric surface of the upper shallow perched unit at the start of the 2000-2005 monitoring period. Color scale represents elevation above mean sea level in feet. Inset polygon shows the outline of the tank farm.

C-3.1 Perched Water Storage Changes 1996-2000

In general, the interpolated potentiometric surface (Figure C-3) for the 1996-2000 period indicates southeastward movement of water in the upper shallow perched unit, with highest water table elevations typically between wells 33-4-1 and 33-2. High water levels are generally maintained longest at well 33-2, so the interpolated surface frequently reflects a mound in that vicinity. Consequently, potential gradients are often radial from that area, though with greater magnitude pointing to the south where heads are typically lowest.

Between 1996 and 2000, the estimated volume of water stored in that portion of the upper shallow perched unit shown in Figure C-2 varied from a minimum of about 11 M gal to a maximum of approximately 17.5 M gal (Figure C-5), a change in volume of approximately 55%. Lowest volumes generally occurred in the fall, and peak volumes tended to occur in April, with the exception of 1997, when volume peaked in February.

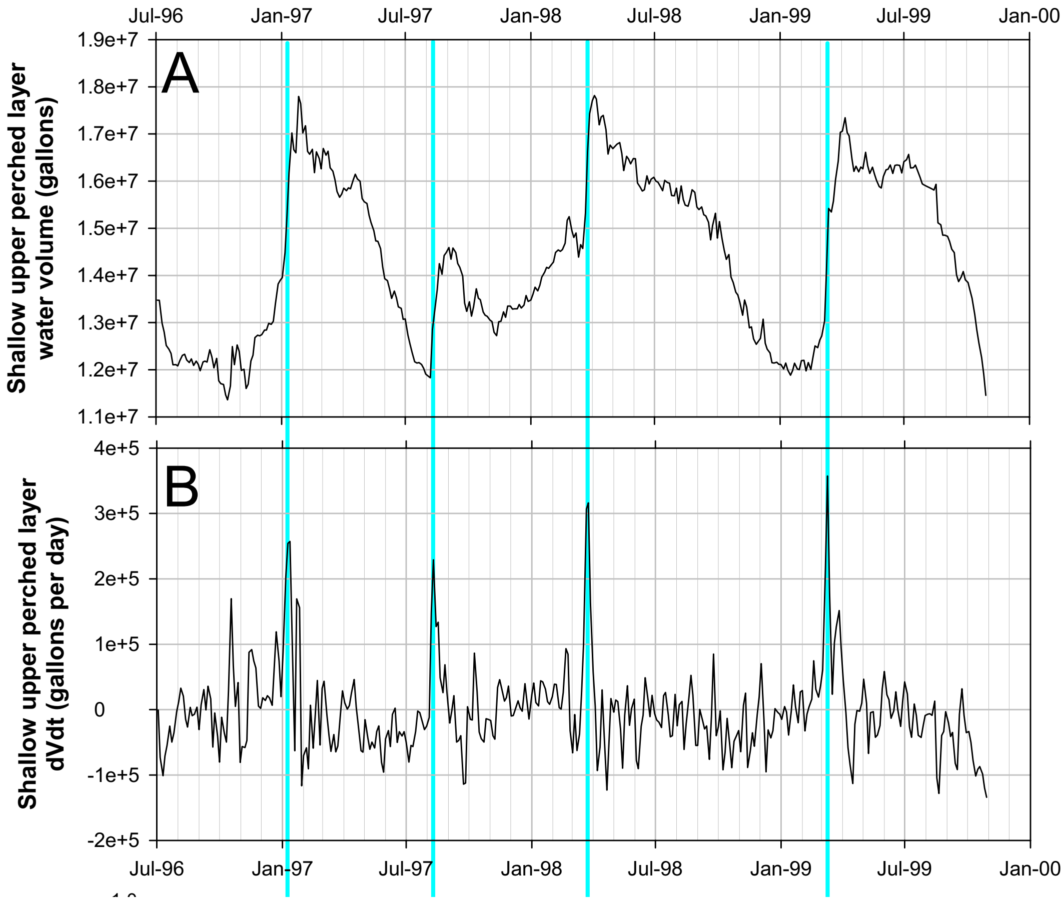

Figure C-5. Water volume in the upper shallow perched water unit (A) and the inferred rate of change of storage in the upper shallow perched unit (B).

These changes in volume represent an imbalance between inflow and outflow, neither of which is known. That imbalance can be represented as a volumetric flux by the derivative of the volume change per unit time over the area. The resulting ‘dVdt’ time series (Figure C-5B) emphasizes how the rate of change in storage varies over time, and may provide a better means of identifying potential mechanisms for those changes. On this plot, positive values indicate increasing perched water volume, and negative values indicate declining volume. The large peaks on Figure C-5B represent brief periods when the volume of upper shallow perched water increased rapidly in response to recharge events.

C-3.2 Storage Changes Since 2000

During the most recent period of uninterrupted monitoring of the upper shallow perched water unit, approximately the beginning of 2003 to the present, fluctuating water level histories are available for the same set of wells as for the period between 1996 and 2000, except for well MW-4-2, near the eastern edge of the facility, which has generally been dry since 2000. As mentioned previously, however, the more recent data appear to reflect significantly different behavior than is evident in the earlier period, and some of these differences may reflect differences in reference elevations or other unknown factors.

The shape of the interpolated potentiometric surface (Figure C-4) varies significantly over time, and overall shape is similar to that during the earlier period. Heads are highest in the northwest, with highest elevations occurring along the western side of the tank farm, in the vicinity of well 33-2. Horizontal hydraulic gradients are typically to the south and east from that area. A second broad area of higher head existed between wells MW 5-2, MW-2, and 55-06, so that potential gradients generally indicate southward flow of groundwater, with steepest gradients south of well 33-2.

The relative changes in volume inferred for the recent monitoring period (Figure C-6), up to ~66%, are actually larger than the relative change observed during the earlier period. Inferred rates of change (dVdt) are smaller, however, less than 100,000 gpd at all times.

C-4. CUMULATIVE CHANGES IN STORAGE

The changes in volume in the perched unit (Figure C-7) generally appear to reflect a seasonal transient recharge signal. The average annual flux due to this transient recharge may be estimated from the cumulative increases or decreases over the course of several years (Figure C-8 [bottom]). During the earlier (1996-2000) monitoring period considered here, the slope of that curve indicates that the transient recharge flux is approximately 6 to 8 million gpy. During the more recent, and generally drier, monitoring period, that flux is slightly less, on the order of 4 to 5 million gpy. Divided by the assumed area of influence (depicted in Figure C-2), these fluxes represent an average vertical recharge of approximately 14 cm/year. A previous infiltration modeling study for the INTEC facility (DOE-NE-ID 2005, Appendix B) estimated that recharge rates across the facility are approximately 18 cm/yr, or 80% of annual precipitation. The area-averaged net infiltration rate of ~14 cm/yr is thus consistent with a hypothesis that changes in perched water levels are largely driven by direct recharge. On the other hand, heterogeneities and fracture patterns in the unsaturated zone are generally thought to cause significant

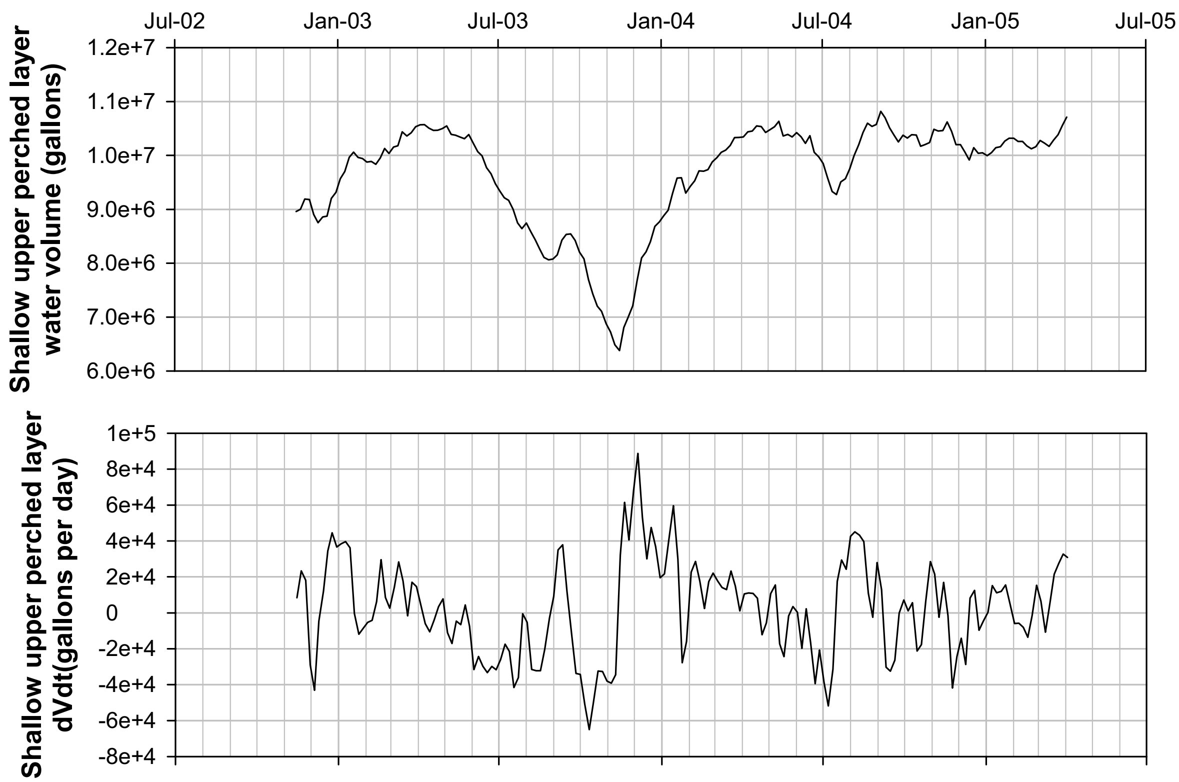

Figure C-6. Water volume in the upper shallow perched water unit (A) and the inferred rate of change of storage in the upper shallow perched unit (B). Grid spacing on the abscissa is monthly.

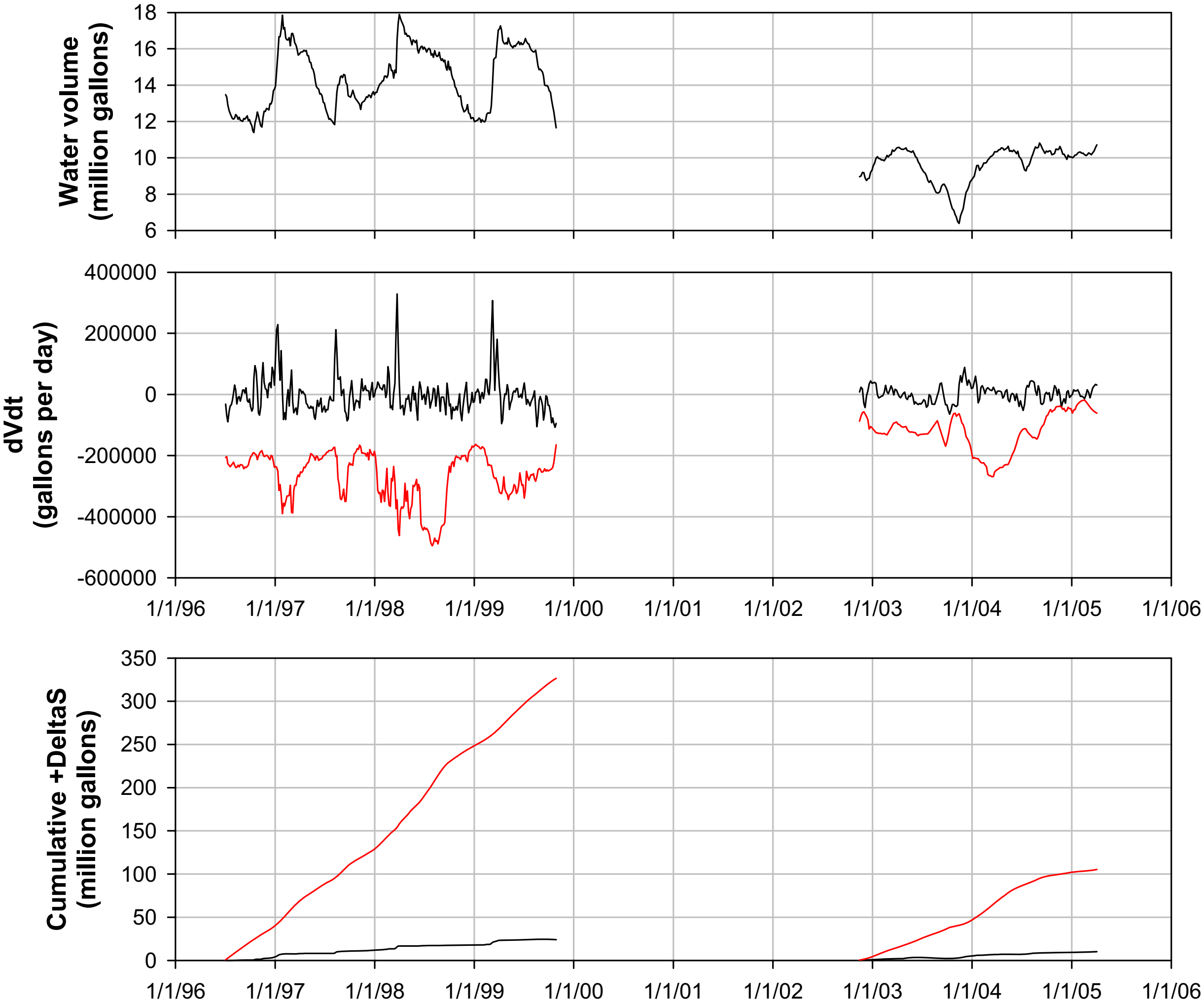

Figure C-7. (A) Upper shallow perched water volume. (B) Changes in volume over time in the upper shallow perched (black line) and area-integral of vertical fluxes calculated as described in the text. (C) Cumulative fluxes calculated from integration of increases in stored volume (black line) and total vertical flux assuming that all flow through the upper shallow perched layer is vertical and downward (red line).

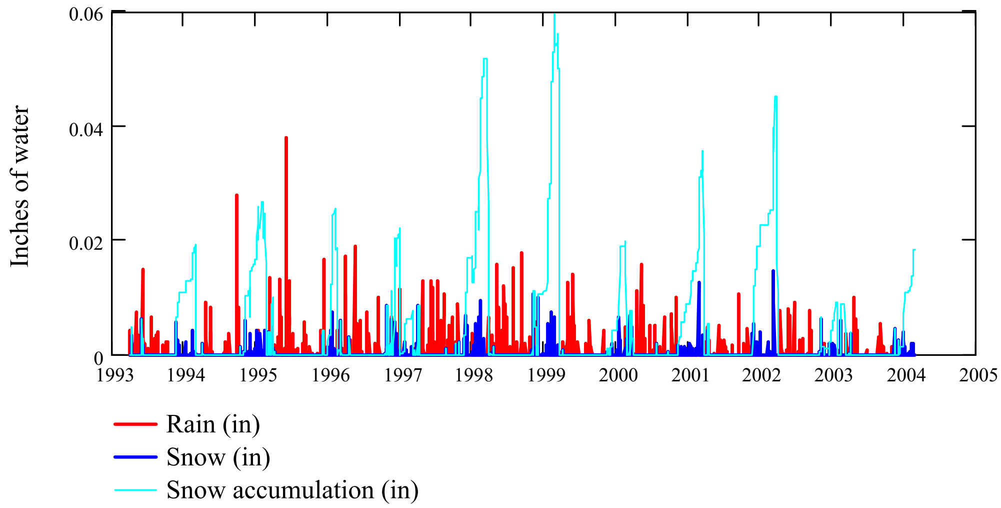

Figure C-8. Daily rainfall (inches), snow fall (inches water equivalent) and accumulated snow (inches water equivalent) at the Central Facilties Area (CFA), computed from meteorological data from the CFA weather station using the temperature index method described in the text.

horizontal redistribution of infiltrating moisture, and it seems likely that the area contributing recharge to the upper shallow perched layer is considerably greater than that delimited in Figure C-2, implying a proportionally smaller average vertical recharge rate.

The inferred rates of change in storage of the upper shallow perched unit are not a direct indication of the flux into or out of the shallow perched unit because they reflect only the imbalance between inflow and outflow. The actual flux through the interbed may include a near steady-state flow that produces little or no change in water level and is thus not apparent in the dVdt time series. Near steady-state fluxes to the vadose zone may occur through a combination of intentional and unintentional facility discharges, such as regular testing of the fire water supply system or leakage from buried water supply lines. Examination of the animated sequence of contour maps developed in this study demonstrates that significant horizontal gradients exist even when stored water volume is at a minimum. During those times, greatest water potentials (highest head) seem to occur between wells 33-4-1 and 33-2, suggesting if a steady-state recharge source to the perched unit does exist, it is likely located in that vicinity.

One means of estimating the total flux through the 110-ft interbed is to assume that flow occurs only in the vertical direction, take the hydraulic potential at the bottom of the interbed as atmospheric, and use the implied vertical gradient, and estimated hydraulic conductivity of the interbed to calculate a vertical flux. Using the spatially and temporally interpolated perched water surface time series described above, net vertical fluxes through the assumed area of influence are 100 M gpy and 50 M gpy for the early and late monitoring periods, respectively. These fluxes likely represent a maximum flux through the interbed, because the area through which flow can occur is likely considerably smaller than that assumed for this calculation and because potential gradients clearly indicate that flow is not strictly vertical.

C-5. CORRELATION WITH INDICATORS OF POTENTIAL INFILTRATION

To attempt to identify the source of the observed changes in stored water volume, we compare the record of perched water volume to several time series related to potential infiltration mechanisms. One potential means of recharging the perched water is leakage through the bed of the BLR. Discharge data for the BLR at Lincoln Boulevard are plotted with the perched volume record in Figures C-9 and C-10. Cursory comparison suggests that the upper perched unit is responding directly to flow in the BLR or that both the river and the perched unit are responding to water availability. The correlation coefficient for this pair of records is 0.36. While the largest changes in perched water volume correspond relatively well with the onset of BLR flow at Lincoln Boulevard, there are several indications that the BLR is not the primary recharge source. First, large decreases in perched water volume frequently occur even when discharge at Lincoln Boulevard is high. Second, examination of individual years indicates that, in some cases, very large increases in perched water volume occur slightly before the onset of flow at Lincoln Boulevard. These differences suggest that the correlation of BLR discharge with perched water volume is not causal, but rather that both respond to infiltration of meteoric water with roughly the same timing.

To examine correlation between perched water volume changes and potential infiltration, we first consider the flux of meteoric water to the land surface, based on long-term meteorological records from the National Oceanographic and Atmospheric Administration weather station at CFA. Because infiltration of meteoric water can include both precipitation and snowmelt, we calculated snow accumulation and melt for the period of record, using a temperature index method. The function essentially assumes that precipitation falls as snow when daily mean temperature is below some critical value, T_{crit}, and melts only when daily mean temperature is above 32ºF, at a rate defined by an empirically determined degree-day factor, R. Because snow frequently occurs when near-surface temperatures are as much as ~º4F above freezing, we assumed a critical temperature of 36ºF and used a degree-day melt factor of 0.04 in. day^{1} ºF^{1}. Snow therefore accumulates on the ground during cold spells and melts rapidly when several warm days occur sequentially. This cycle of accumulation and melt alters the timing of winter precipitation availability to the soil, so the calculated ‘rain plus snowmelt’ signal provides a better indication of the daily flux of meteoric water to the soil surface than does a simple precipitation record. The resultant record of rainfall and snowfall for the period from 1993 to 2004 (Figure C-8) indicates that the fraction of precipitation occurring as snow is rather small. This is consistent with historical climate information from the National Climatic Data Center for Arco, that indicates that snowfall is approximately one third of total precipitation.

The calculated ‘rain plus snowmelt’ record (Figure C-9) is only weakly correlated (correlation coefficient = 0.072) with the perched water volume record, and cursory comparison of these data (Figures C-9 and C-10) would suggest little or no connection between the two. The potential for infiltration to penetrate the surficial soil and thereby recharge groundwater is, however, not simply a function of water flux to the surface, but also of evaporation and/or transpiration from that surface. A parameter that takes into account both the potential effect of evapotranspiration as well as meteoric water availability would thus be a better indicator of potential infiltration. As a simple but effective means of estimating the relative soil wetness, and thus the potential for water flow through the unsaturated soil, we used a Thornthwaite-Mather-type daily water balance (Thornthwaite 1948) to estimate daily evapotranspiration and soil moisture storage for a hypothetical 1-m-thick root zone. The model essentially assumes a fixed soil moisture storage capacity and adds and removes water from that reservoir according to the relative availability of meteoric water and the energy available for evapotranspiration. Water is removed from storage only after depleting the available daily meteoric water input, and evapotranspiration depends on the potential evapotranspiration (PET) rate. In this model, we calculated PET from daily mean temperatures at CFA, using the approach described by Malmstrom (1969):

$$\text{Daily PET (cm)} = 0.409/30 * e_{sat}(T_{air}),$$

where

e_{sat} = water vapor pressure (in millibars)

T_{air} = daily mean air temperature.

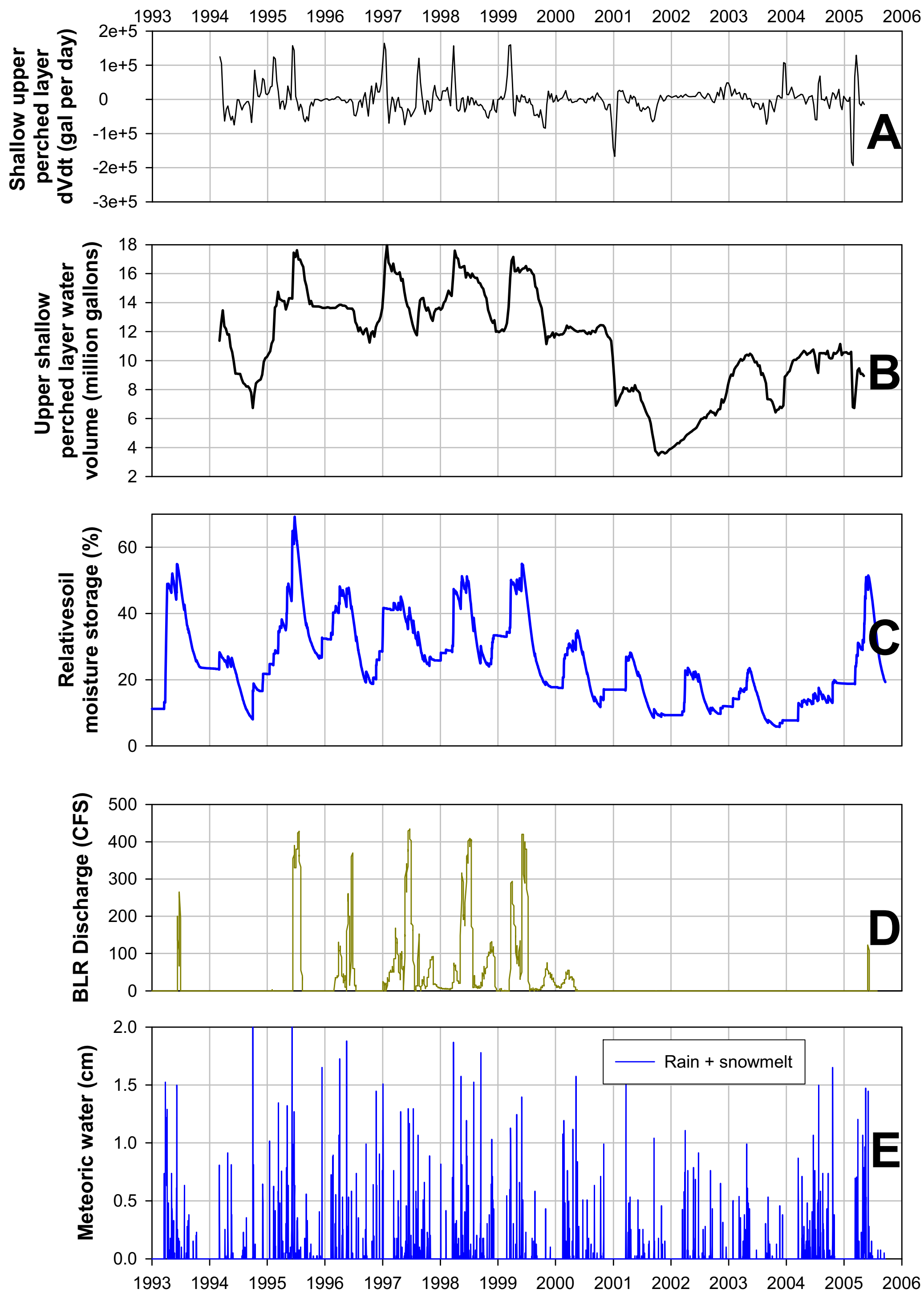

Figure C-9. The inferred rate of change of storage in the upper shallow perched unit (A) calculated from area-integrated volume in the upper shallow perched water unit (B), compared to the calculated relative wetness signal calculated using a Thornthwaite-Mather-type water balance (Thornthwaite 1948) (C), discharge of the BLR at Lincoln Boulevard (D), and rain plus snowmelt record computed from precipitation data from the CFA weather station (E).

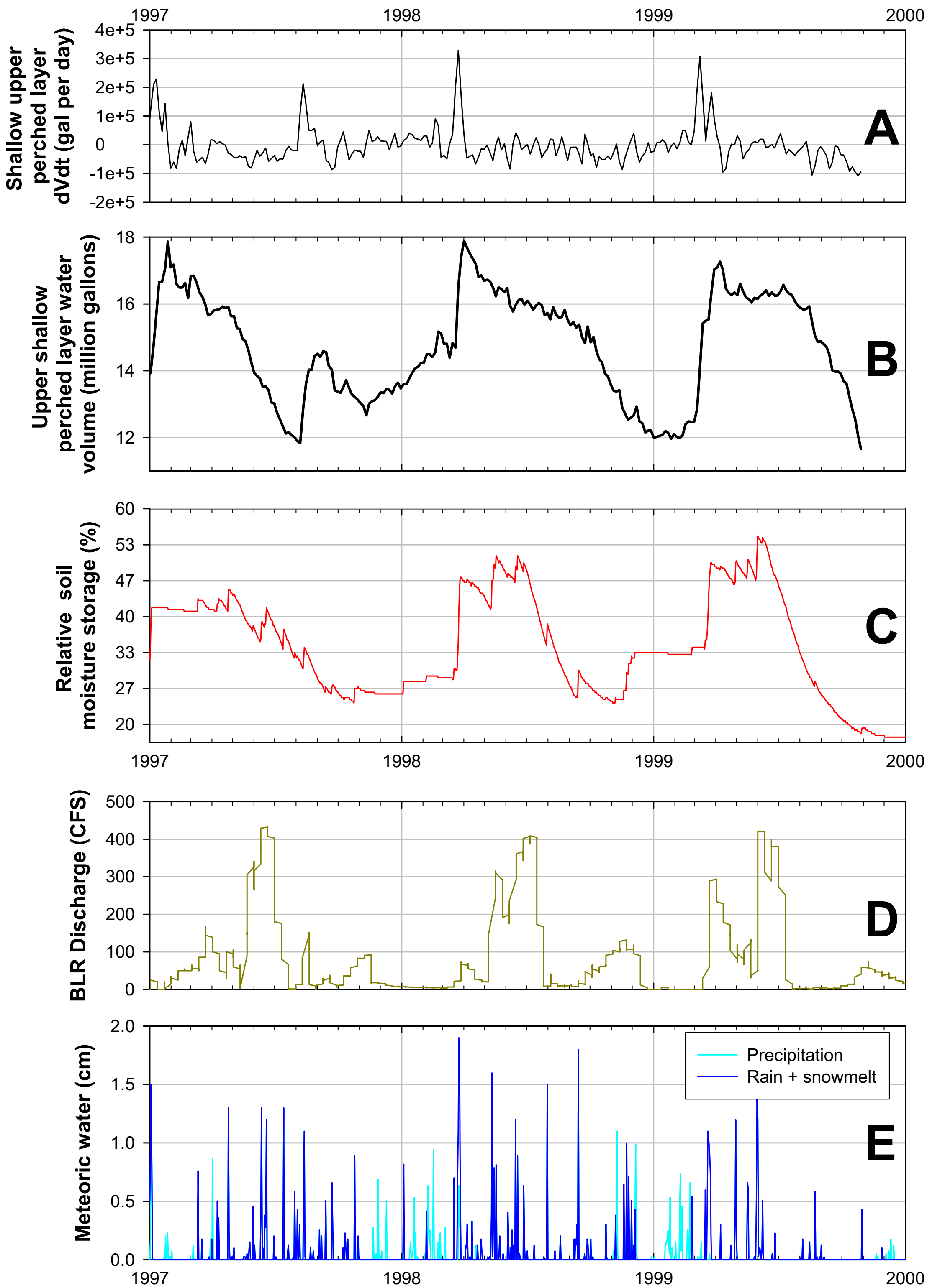

Figure C-10. July 1997 to July 2000 subset of Figure C-9, provided to permit more detailed comparison of timing of peaks in the response records.

As an arbitrary estimate of the soil moisture storage capacity that may be influenced by evaporation and/or transpirative effects, we used a ‘root zone’ thickness of 1 m, with a porosity of 0.3 cm^3/cm^3. It is recognized that vegetation is absent for most of INTEC, and the term “root zone” does not imply that plants are present. Model output is essentially a time series of the amount of soil moisture that would be stored in the hypothetical root zone. No attempt was made to calculate the unsaturated flow that would be associated with these changes in storage, as, again, the primary intent is to attempt to determine whether changes in perched water volume are well correlated with a parameter indicative of the potential for meteoric water infiltration. Output of the Thornthwaite-Mather water balance model calculation, referred to herein as ‘relative wetness,’ is shown in Figures C-9 and C-10. The correlation coefficient between this signal and the upper shallow perched water volume signal is 0.73, essentially twice that for correlation between perched water volume and BLR discharge. That value does not improve when a separation time is imposed on the correlation, suggesting that recharge to the upper shallow perched unit is very rapid and essentially synchronous with the water balance at the surface. The ‘relative wetness’ parameter is, however, slightly sensitive to the assumed storage volume accessible to evapotranspiration and also to the assumptions made in the evapotranspiration and snow accumulation/melt functions. The timing of the major increases in the calculated soil moisture storage should therefore not be considered accurate to within days. Nonetheless, the high correlation between apparent perched water response and the water-balance-modeled soil moisture storage strongly suggests that meteoric water inputs reach the perched water units within approximately a week, and this is consistent with observed response of wells in the lower shallow perched water unit to well-defined facility water leaks (Section 2.2 of this report).

While the timing of increases in perched water volume between ~1997 and 2000 (Figure C-10) corresponds closely to dramatic increases in the ‘relative wetness’ parameter and the onset of flow in the BLR at Lincoln Boulevard, timing of perched water response in other years suggests that the BLR is not the primary recharge source. Perched water hydrographs for the period 1991–1996 were summarized in the Comprehensive RI/FS for the Idaho Chemical Processing Plant OU 3-13 at the INEEL (DOE-ID 1997). That report concluded that the upper shallow perched water unit responded rapidly (within days) to flow in the BLR in 1995, even though there was no perched water response to river flow in 1993, when river flow persisted for approximately 3 weeks. Comparison of the perched water hydrographs for that period with BLR discharge and the relative wetness parameter developed for this study (Figure C-11) indicates that, in 1995, the perched water wells were very likely responding not to river flow but to rapid infiltration. Due to the large amount of rain, the relative wetness parameter increased sharply at the same time as the onset of river flow in 1995, coincident with water level increases in wells 33-4-1 and 37-4. Similarly rapid increases in water levels in those wells also occurred in 1993, however, well before the onset of river flow but at the same time as increases in the relative wetness parameter. That those wells would respond rapidly to river flow one year, without responding to 3 weeks of flow in another year seems unlikely, and, as the relative wetness indicator appears to be a better predictor of changes in perched water levels, it seems more likely that rapid infiltration of meteoric water is the primary recharge mechanism responsible for perched water level fluctuations. Note that wells 33-4-1 and 37-4, as well as well 33-2, generally dominate the calculated upper shallow perched water volume signal because water levels in those wells are generally high and because they have a similar response pattern. Correspondence of perched water levels in those wells with the relative wetness parameter for the 1991–1996 period is thus consistent with the correlation described for later periods.

A similar disparity between perched water response and river flow appears to have occurred in 2005. With the exception of one well very close to the river (BLR-CH), upper shallow perched water wells showed little or no response to the June 2005 BLR flow event (Appendix D), but at least some of those wells (e.g., 33-2, 37-4) show large increases in head in March, at a time when the relative wetness parameter is also increasing dramatically.

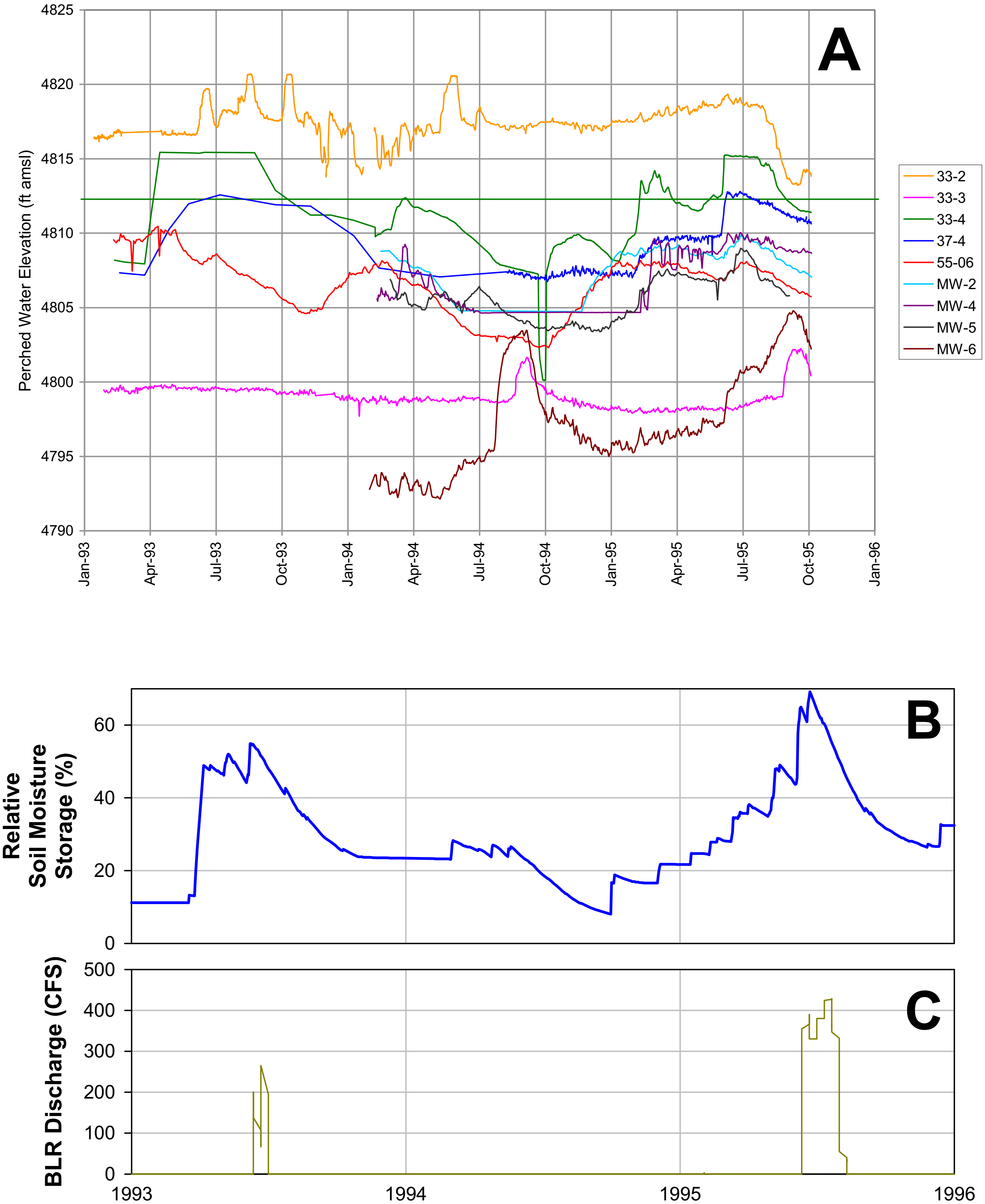

Figure C-11. Comparison of perched water hydrographs between 1993 and 1996 (A) to the Thornthwaite-Mater water-balance-based 'relative wetness' soil moisture storage parameter (B) discussed in the text and discharge in the BLR at Lincoln Boulevard (C).

C-5.1 Comparison with Results of Previous Studies

It should be emphasized that the simple water balance model presented here is not intended to accurately represent natural infiltration processes at the INTEC facility because the actual processes are likely highly variable in nature and the distribution of surface water inputs is yet only poorly quantified. Infiltration processes likely range from slow diffuse recharge through large flat unvegetated areas to rapid localized infiltration through runoff collection basins or unlined drainage ditches. Rather than attempt to model all of these processes, the water balance model simply attempts to represent the potential for evaporation with a single-valued soil moisture storage, or 'relative wetness', parameter that incorporates the two primary controls on infiltration – meteoric water input and evapotranspiration. One previous study of the perched water response employed a similar approach, and yet another study included the effect of unsaturated flow, as well as evapotranspiration, on potential recharge to perched water. Comparison of the results of the present investigation with these previous studies is instructive because each of the approaches differs significantly in methodology and/or data considered.

Martian (DOE-ID 2005, Appendix B) calibrated an unsaturated flow model to neutron probe measurements at several wells at INTEC and used the calibrated model and daily meteorological data to estimate drainage through the alluvium assuming essentially one-dimensional flow. Simulated drainage at a depth of ~10 m for well A-68 is fairly typical of the simulated drainage calculations at other locations considered in that report. The simulated daily drainage for that well corresponds closely to the relative wetness parameter signal derived from the simple Thornthwaite-Mather water balance model (Figure C-12), but the drainage time series lags the relative wetness parameter by several months. Perched water levels, however, appear to respond without lag to the relative wetness indicator of potential infiltration. Recharge thus appears to take place much more quickly than is likely to occur via diffuse unsaturated flow through the alluvium, where infiltration is assumed to be evenly distributed over the surface.

Martian (2003) also completed a time series analysis of perched water response at INTEC, using meteorological data to calculate a precipitation plus snowmelt minus potential evaportranspiration signal and comparing that estimated infiltration signal to data from well 55-06. That study concluded that the perched water response at well 55-06 appeared to reflect infiltration but with a response lag of at least 2 months. In contrast, results of the current study suggest that there is virtually no time lag between potential infiltration and perched water response. While there are significant differences between the estimated infiltration calculation used in these two studies (Figure C-13), the primary difference in conclusions appear to result from choice of wells used to represent the perched water response. The area-integrated perched water volume estimate used in the present study is heavily weighted by the response of wells 33-2, 33-4-1, and 37-4. Those wells have a very different response than well 55-06, and it appears that correlation of the relative wetness infiltration indicator of this study would also show only poor correlation with the response described by well 55-06.

C-5.2 Tensiometer Response

Some tensiometers installed near the depth of the 110-ft interbed also record significant changes in soil moisture potential that may reflect rapid infiltration of meteoric water. The 132-ft tensiometer in the BLR tensiometer set, for example, indicates a switch from saturated to unsaturated conditions several times between July 2001 and January 2005, during which period no discharge was recorded in the BLR at Lincoln Boulevard. Comparison of that tensiometer record with our calculated relative wetness parameter and the CFA precipitation record, however, does not consistently suggest a strong connection. Water levels in nearby shallow perched well BLR-CH (40 ft away) correlate very well with the tensiometer data for the 132-ft deep tensiometer (Figure C-14). The wetting event observed during October 2003 to

October 2004 does not correspond with elevated relative soil moisture (Figure C-11) but may be at least partly attributable to an underground fire water line leak at nearby water supply well CPP-02 that was repaired during October 2004. BLR perched wells and tensiometers all indicate a sharp drop in vadose zone water contents following that date.

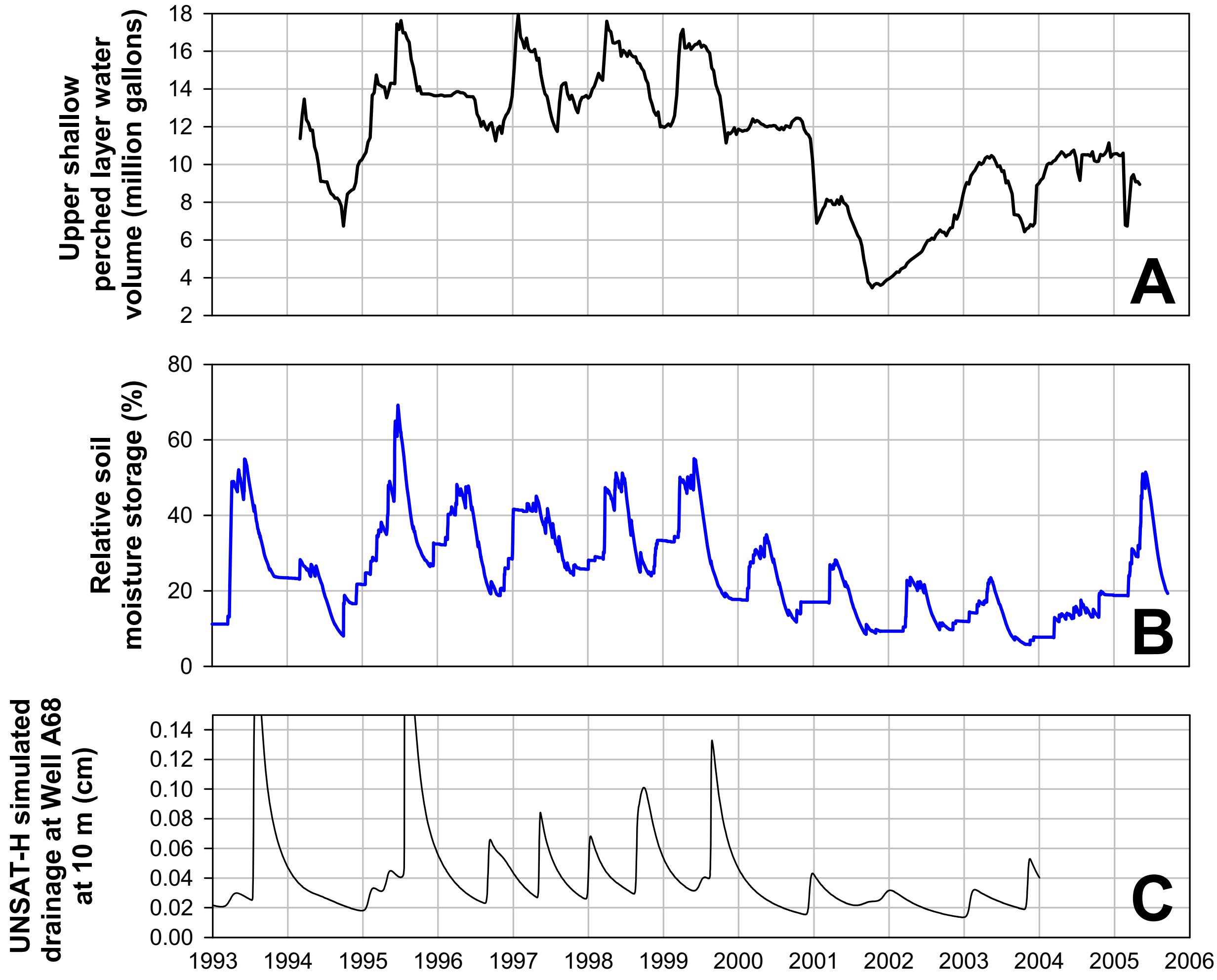

Figure C-12. Comparison of two methods of estimating potential infiltration to the estimated perched water volume record (plot A) discussed in the text. Plot B is the relative wetness signal calculated using a Thornthwaite-Mather-type water balance. Plot C is an UNSAT-H simulation (DOE-ID 2005, Appendix B) of drainage to basalt at 10-m depth below land surface.

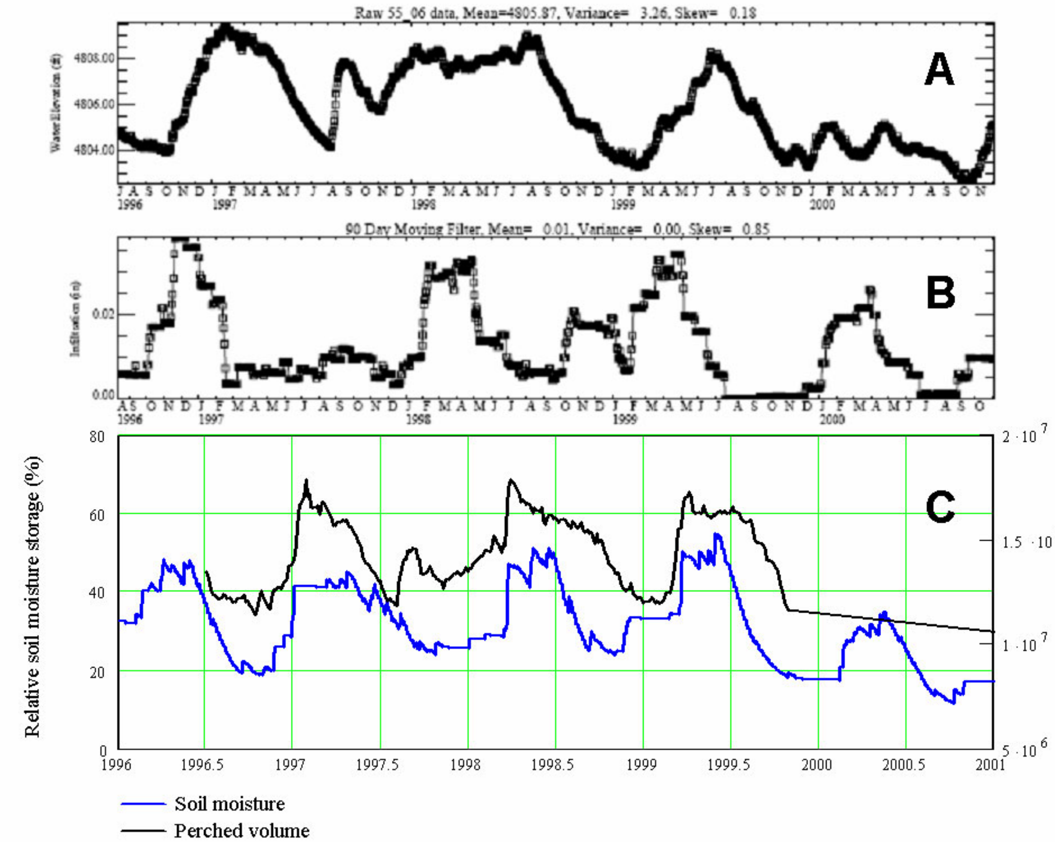

Figure C-13. Perched water response at well 55-06 (A) compared to Martian (2003) estimated infiltration time series (with 90-day moving average filter) (B) and the relative wetness signal calculated using the Thornthwaite-Mather-type water balance model discussed in the text (C; blue line). Also shown is the estimated perched water volume time series (C; black line) calculated as discussed in the text.

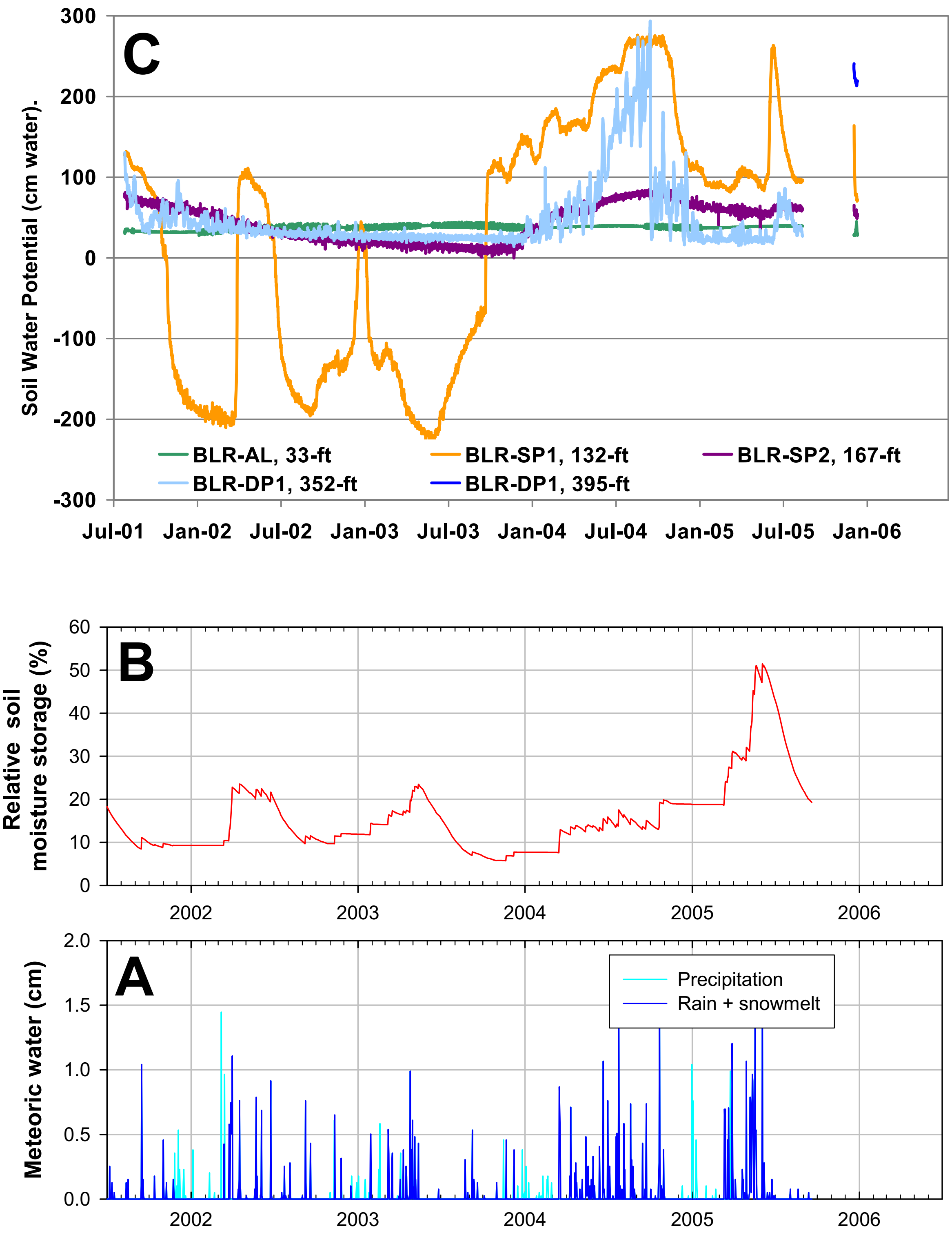

Figure C-14. Comparison of moisture potential data from the BLR tensiometer set (top) with the meteoric water input signal (bottom) and with the 'relative wetness' parameter (middle) described in the text.

C-6. CONCLUSIONS

The degree of correlation between (a) the time series for the upper shallow perched water volume and the calculated ‘relative wetness’ parameter and (b) coincidence in timing of sharp increases in both records strongly indicate that changes in head in the upper shallow perched layer are primarily caused by infiltration of rain and snowmelt, rather than via recharge through the bed of the BLR. This conclusion is based largely on two observations noted in this study: (1) while the apparent perched water response to the onset of river flow is rapid, large declines in perched water heads occur during times of high river discharge and (2) in both 1993 and 2005, upper shallow perched water levels appeared to respond to the rapid rise in soil moisture from precipitation infiltration but not to subsequent river flow.

Inferred changes in the volume of water stored in the upper shallow perched unit, for the area identified in Figure C-2, indicate that this seasonal infiltration signal contributes approximately 4 to 8 M gpy to water flux through the perched layer. It should be noted that, although the model assumes an even distribution of precipitation infiltration across the area of interest, in reality, focused recharge occurs as a result of the drainage configuration of the facility. The net flux through the perched water zone likely includes a near steady-state flux that produces little to no change in stored water volume and thus cannot be identified using the methods described here. Evidence that some nearly steady flux to the system does occur is based on records of water usage at the INTEC facility, as well as from known regular discharges to unlined ditches from fire water system testing, lawn irrigation, and other events.

Quantification of anthropogenic contributions to the perched water has been difficult because little confidence existed in any of the estimated fluxes to the system. With the estimates presented here, we suggest that the facility water contribution to flux through the upper shallow perched unit could be calculated if the dilution rate of the meteoric water input signal could be measured. An atmospherically derived cosmogenic nuclide with a short half-life, such as sulfur-35, that would exist in the meteoric water input signal, but not in the facility water, might provide a means of quantifying the dilution rate of meteoric water in the upper shallow perched unit. The apparent rapid response of the perched water to the annual increase in soil moisture storage suggests that meteoric water reaches the shallow perched zone sufficiently rapidly that such short half-life radionuclides should persist in measurable quantities in perched water.

C-7. REFERENCES

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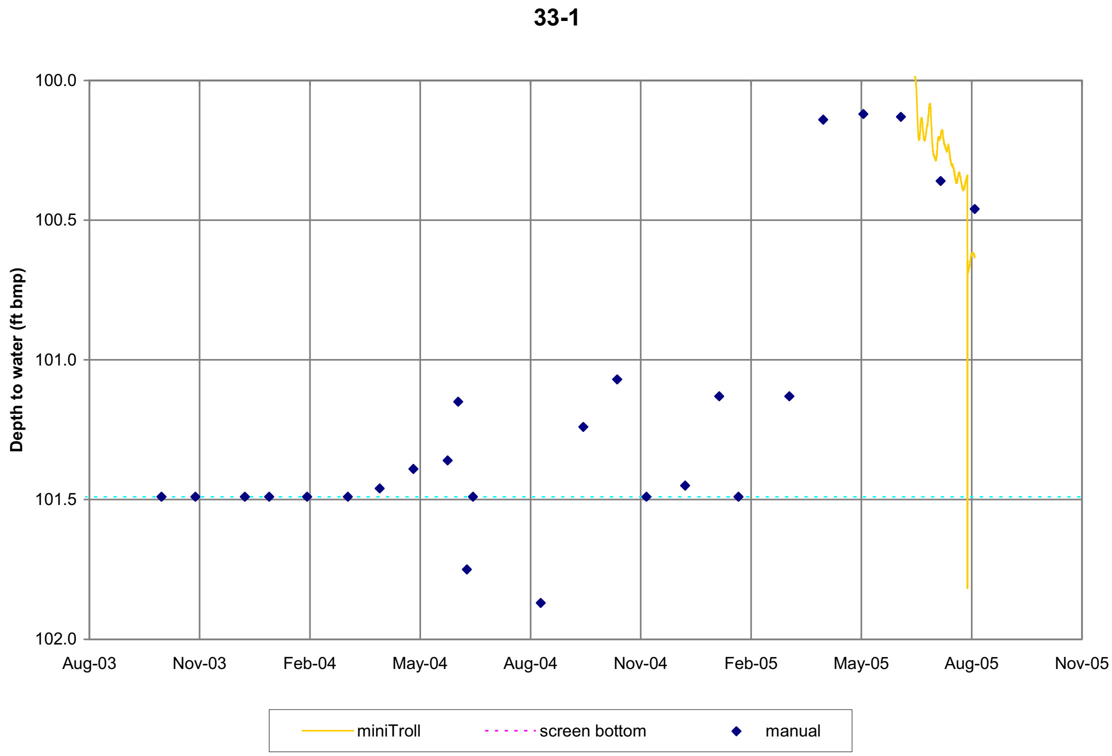
Thornthwaite, C. W., 1948, “An approach toward a rational classification of climate,” *Geographical Review*, *38*: pp. 55-94

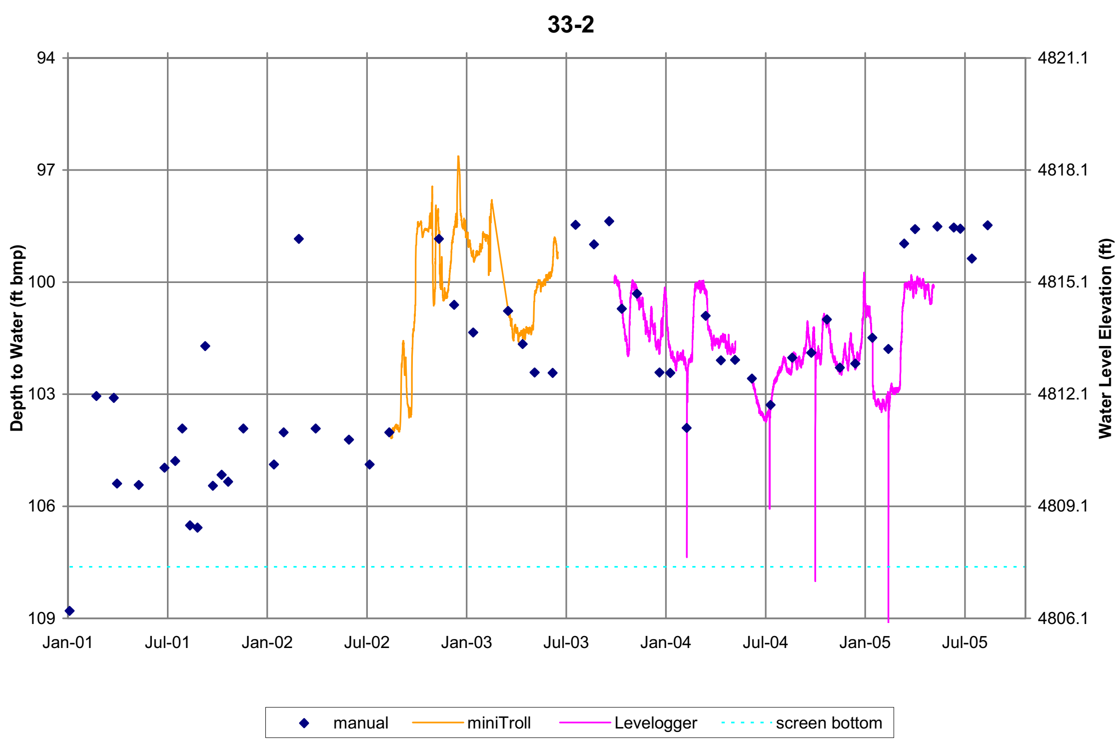
Appendix D

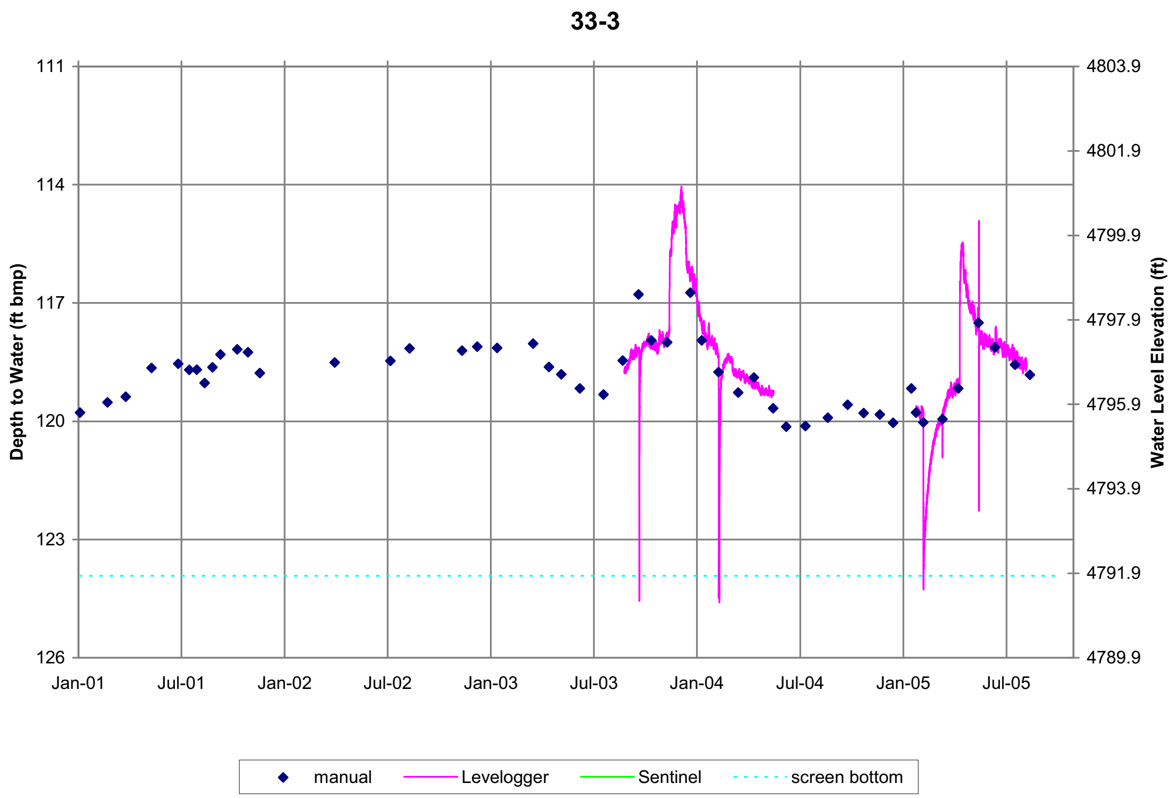
Perched Water Hydrographs

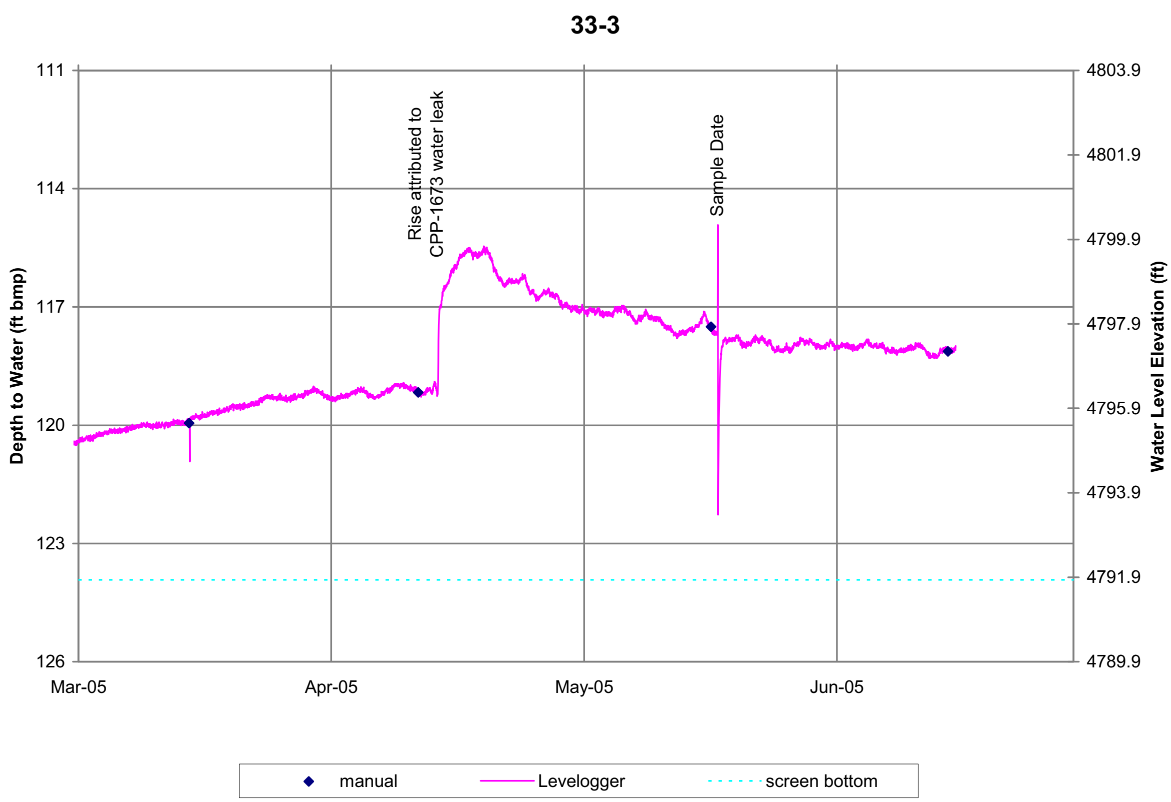
Appendix D

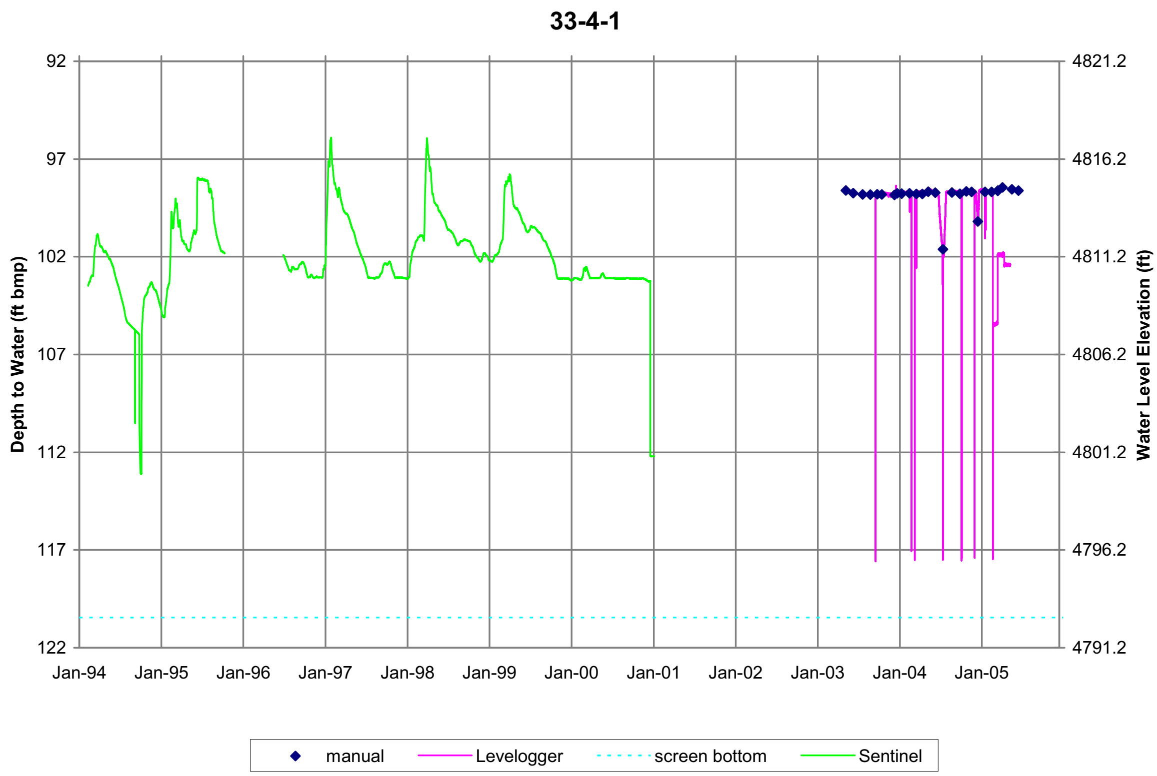
Perched Water Hydrographs

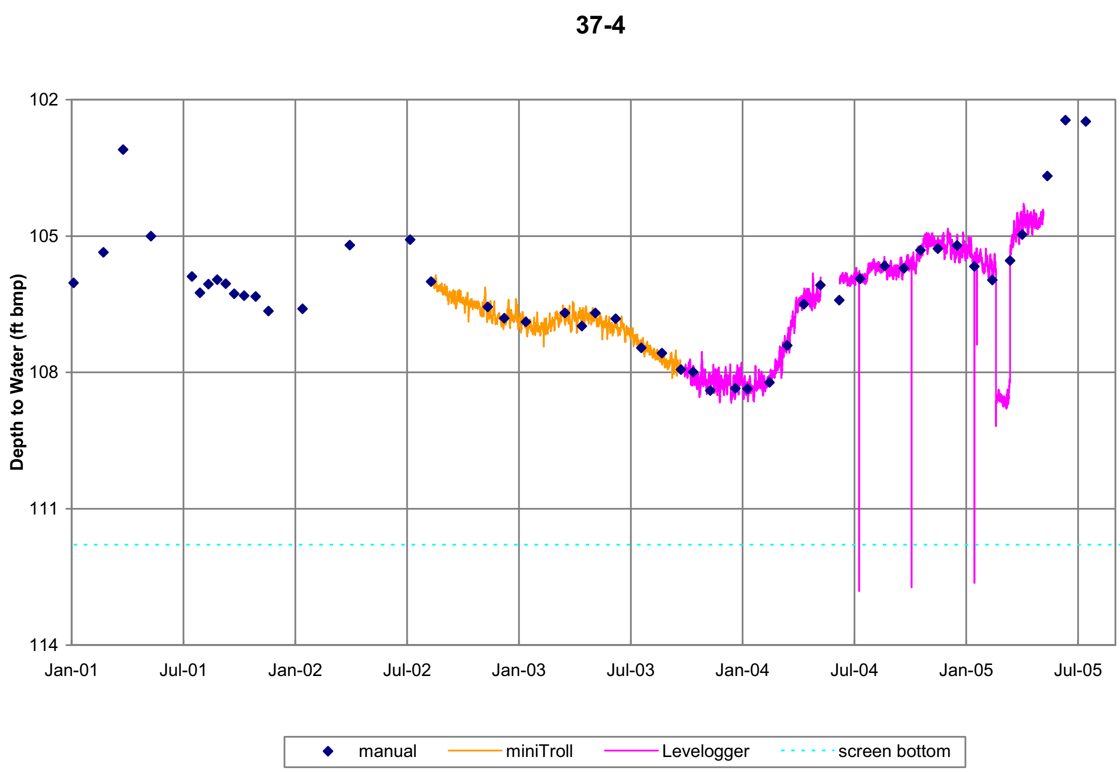


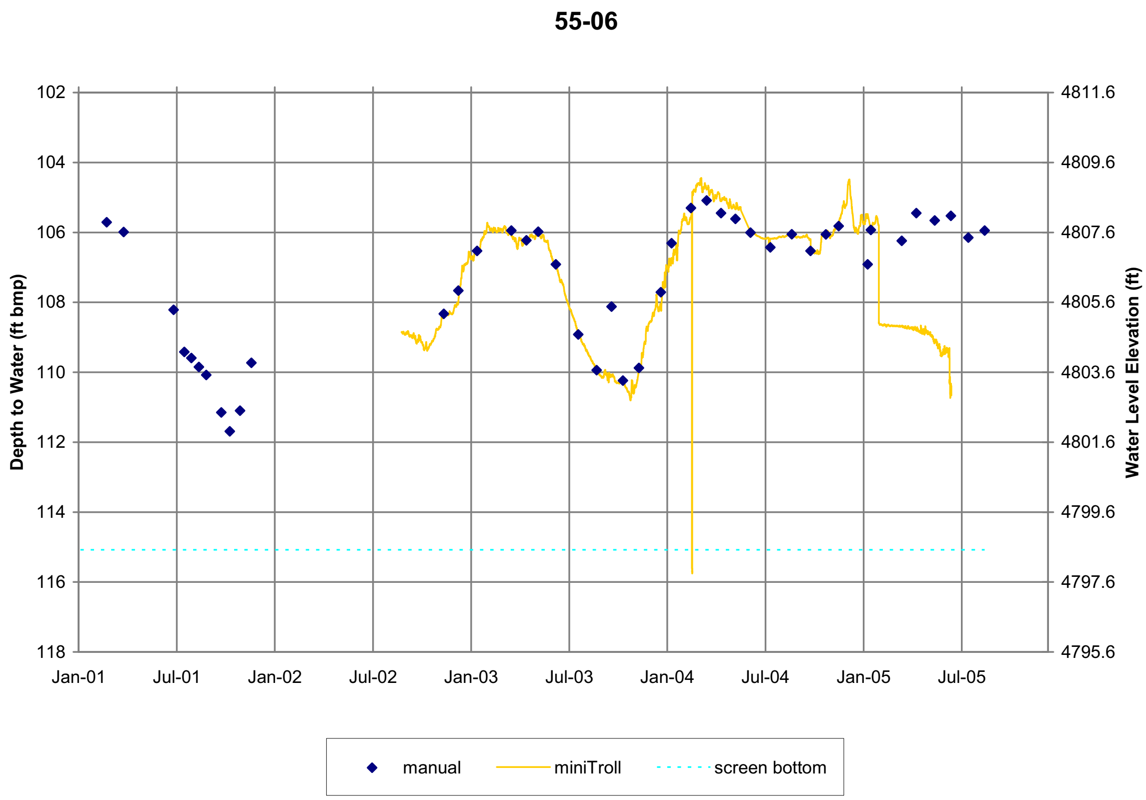



33-3
Depth to Water (ft bmp)
Water Level Elevation (ft)
111
114
117
120
123
126
4803.9
4801.9
4799.9
4797.9
4795.9
4793.9
4791.9
4789.9
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
manual
Levelogger
Sentinel
screen bottom

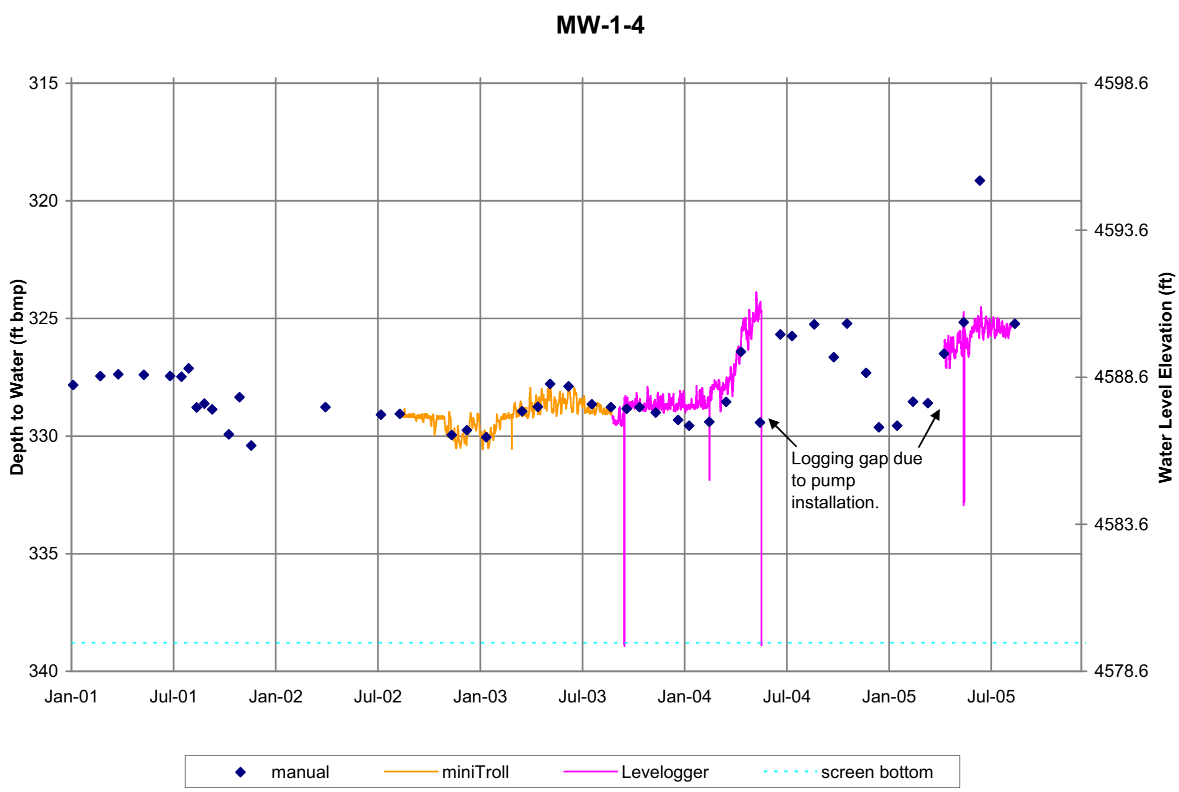

33-3
Depth to Water (ft bmp)
Water Level Elevation (ft)
Rise attributed to CPP-1673 water leak
Sample Date
111
114
117
120
123
126
4803.9
4801.9
4799.9
4797.9
4795.9
4793.9
4791.9
4789.9
Mar-05
Apr-05
May-05
Jun-05
manual
Levelogger
screen bottom


33-4-1
Depth to Water (ft bmp)
Water Level Elevation (ft)
92
97
102
107
112
117
122
4821.2
4816.2
4811.2
4806.2
4801.2
4796.2
4791.2
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
manual
Levelogger
screen bottom
Sentinel

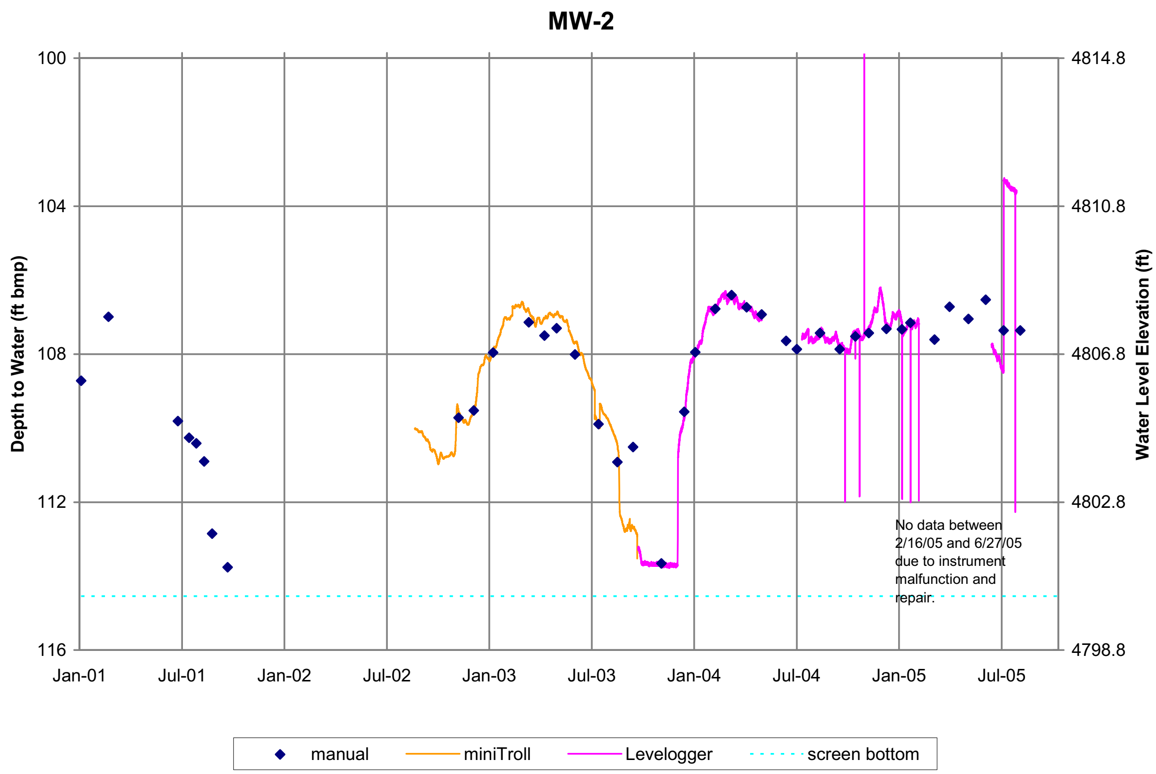

37-4
Depth to Water (ft bmp)
102
105
108
111
114
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
manual
miniTroll
Levelogger
screen bottom



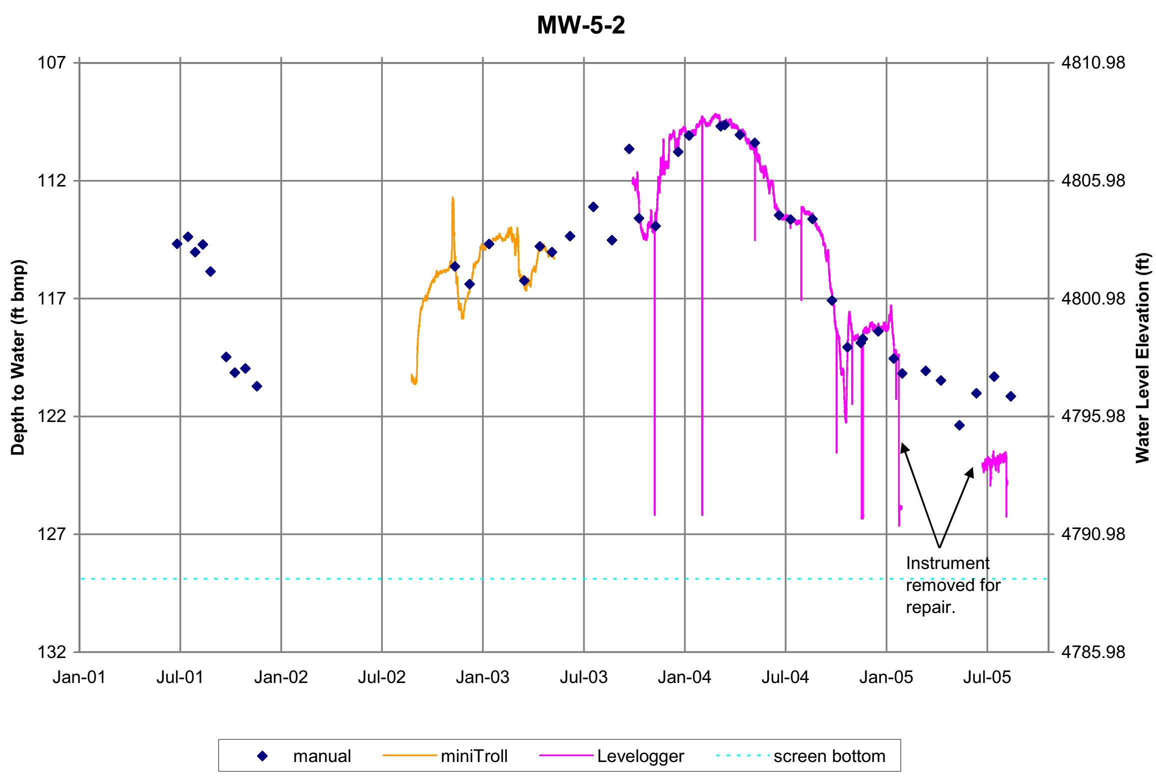
55-06
Depth to Water (ft bmp)
Water Level Elevation (ft)
102
104
106
108
110
112
114
116
118
4811.6
4809.6
4807.6
4805.6
4803.6
4801.6
4799.6
4797.6
4795.6
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
manual
miniTroll
screen bottom



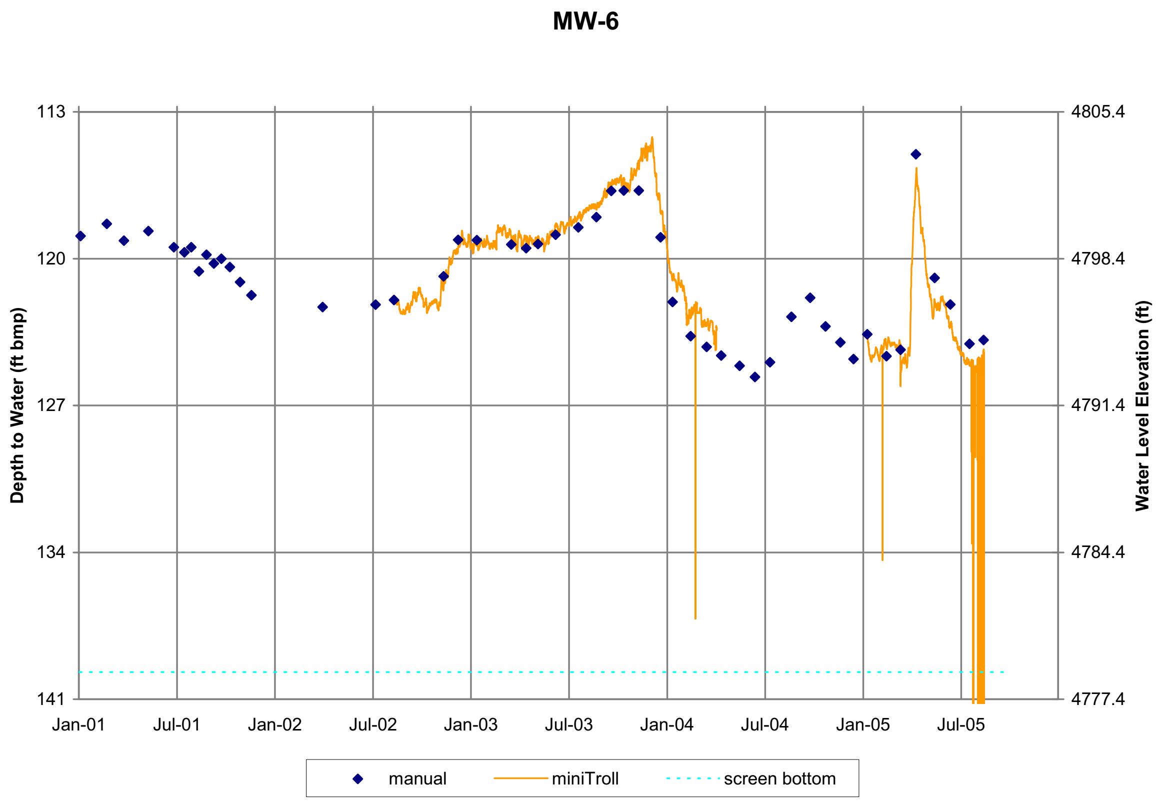
MW-1-4
Depth to Water (ft bmp)
Water Level Elevation (ft)
315
320
325
330
335
340
4598.6
4593.6
4588.6
4583.6
4578.6
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Logging gap due
to pump
installation.
manual
miniTroll
Levelogger
screen bottom

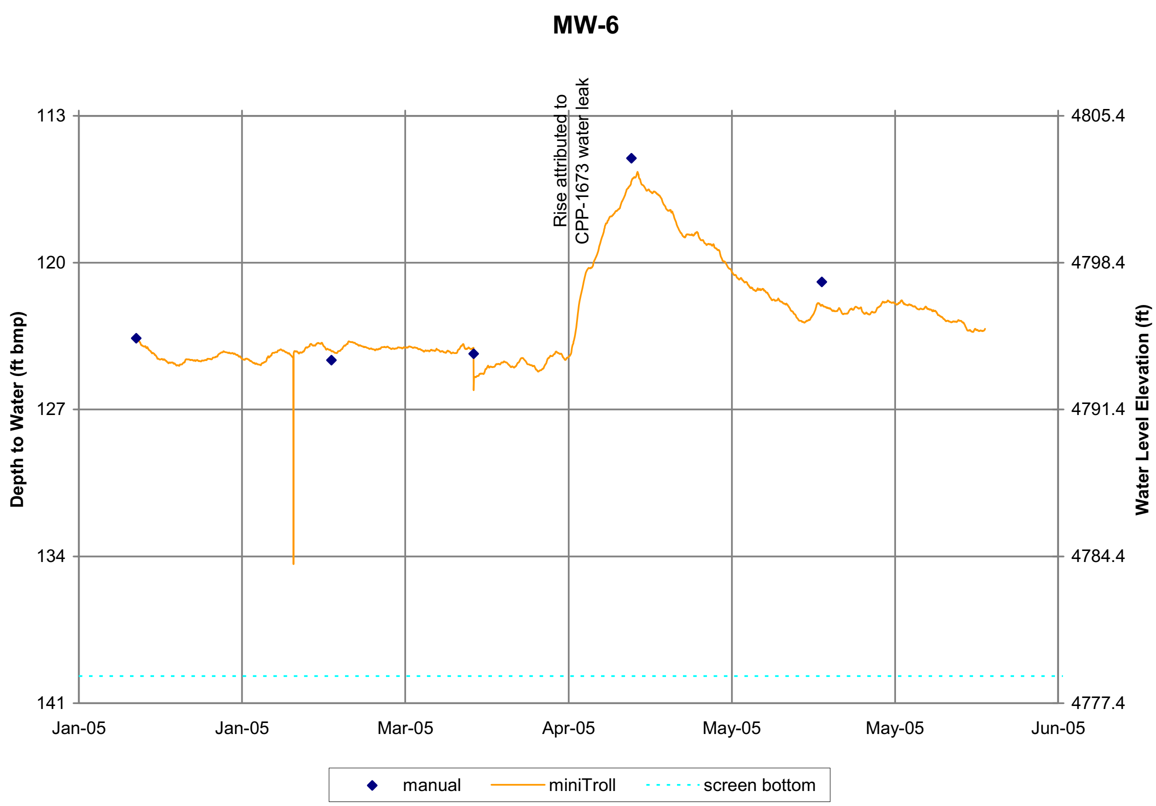


MW-2
100
104
108
112
116
4814.8
4810.8
4806.8
4802.8
4798.8
Depth to Water (ft bmp)
Water Level Elevation (ft)
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
No data between 2/16/05 and 6/27/05 due to instrument malfunction and repair.
manual
miniTroll
Levelogger
screen bottom

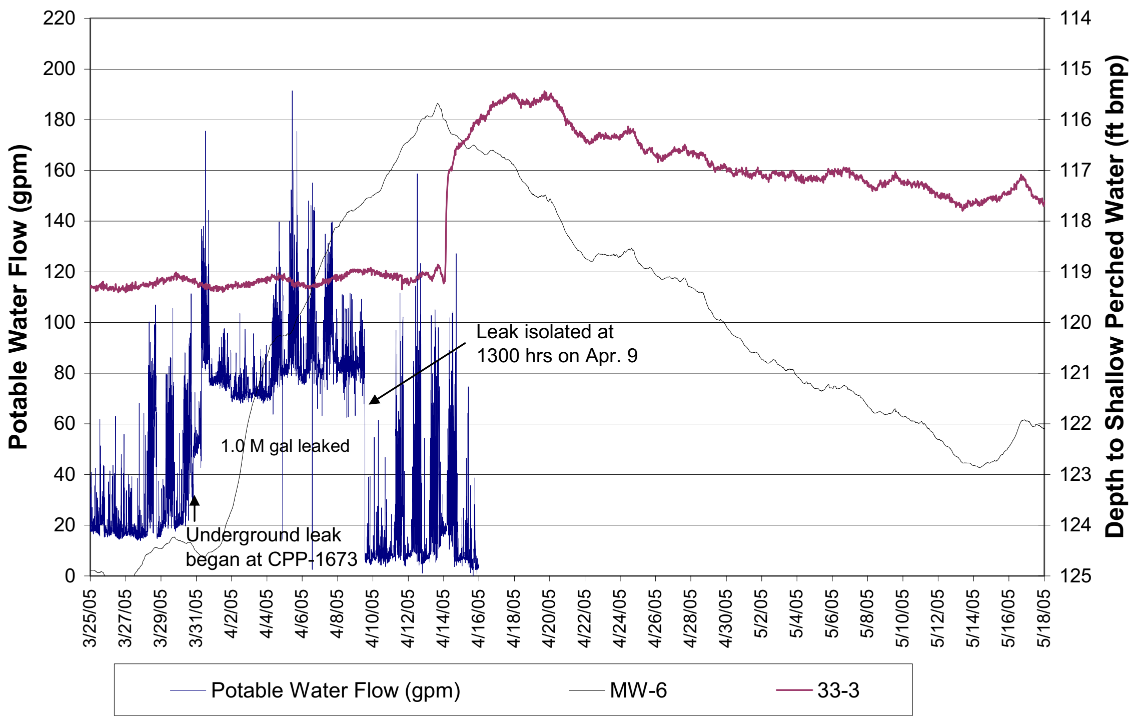


MW-5-2
107
112
117
122
127
132
4810.98
4805.98
4800.98
4795.98
4790.98
4785.98
Depth to Water (ft bmp)
Water Level Elevation (ft)
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Instrument removed for repair.
manual
miniTroll
Levelogger
screen bottom

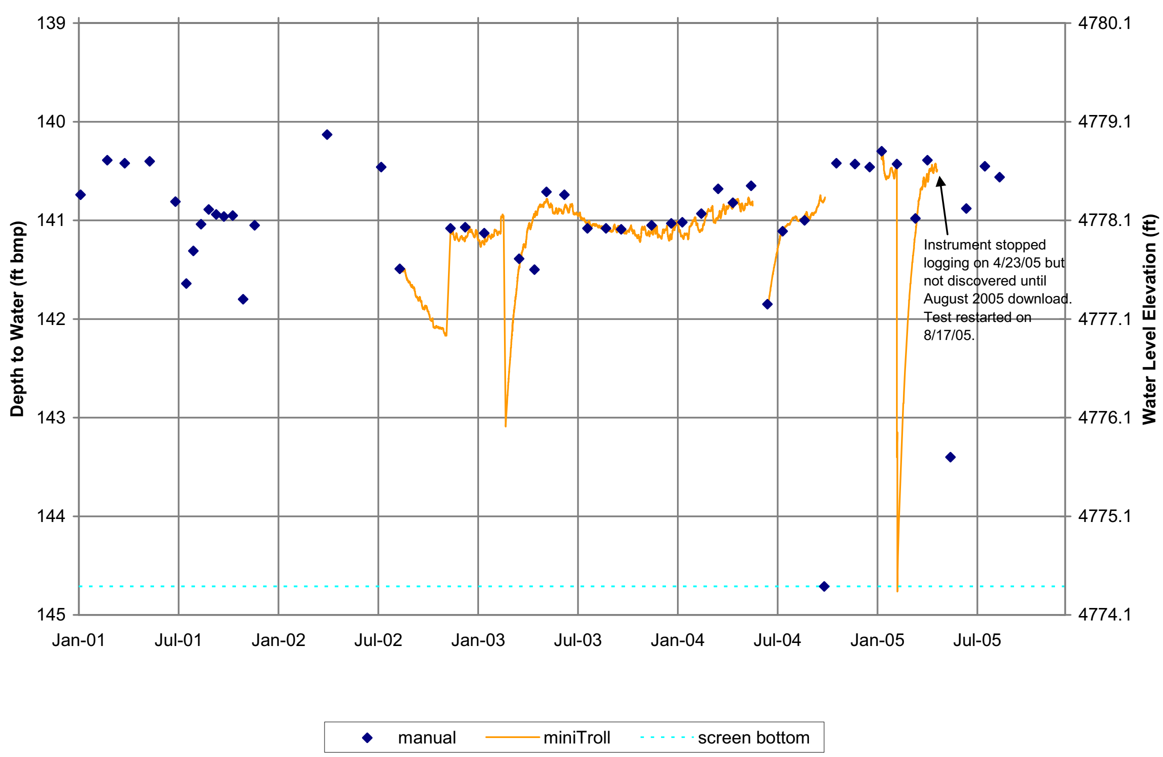

MW-6
113
120
127
134
141
4805.4
4798.4
4791.4
4784.4
4777.4
Depth to Water (ft bmp)
Water Level Elevation (ft)
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
manual
miniTroll
screen bottom

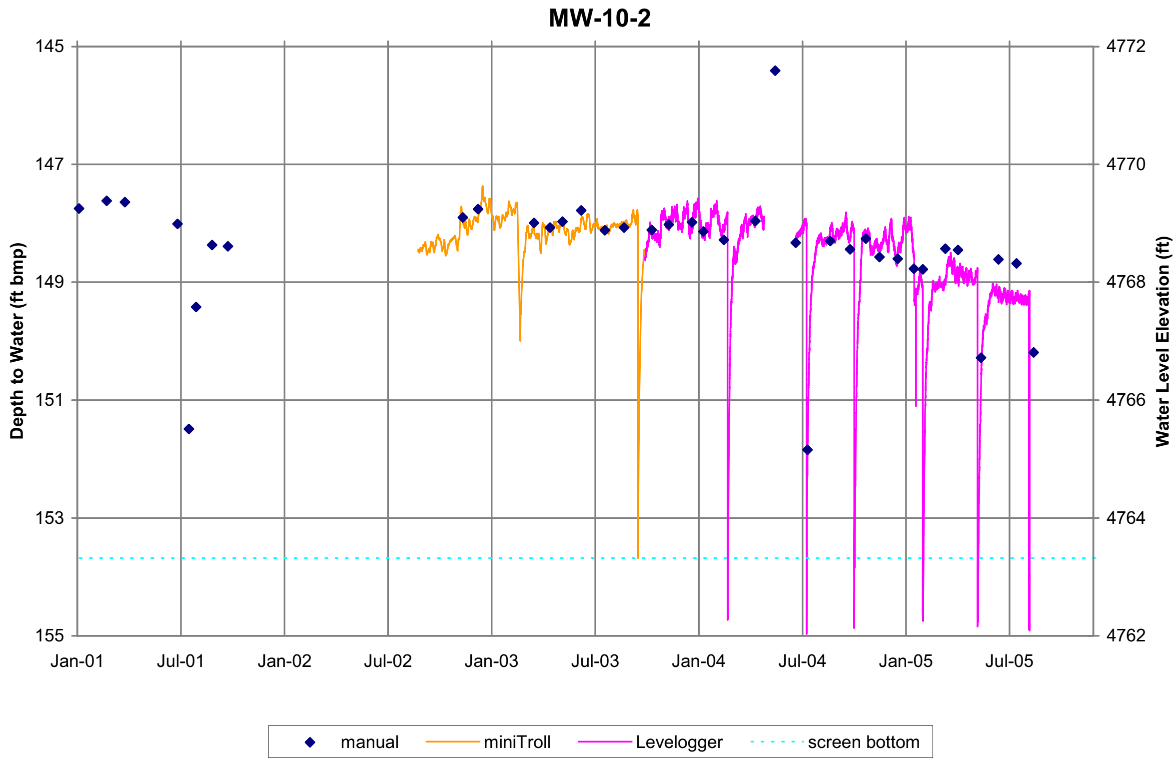

MW-6
Rise attributed to
CPP-1673 water leak
113
120
127
134
141
4805.4
4798.4
4791.4
4784.4
4777.4
Depth to Water (ft bmp)
Water Level Elevation (ft)
Jan-05
Jan-05
Mar-05
Apr-05
May-05
May-05
Jun-05
manual
miniTroll
screen bottom

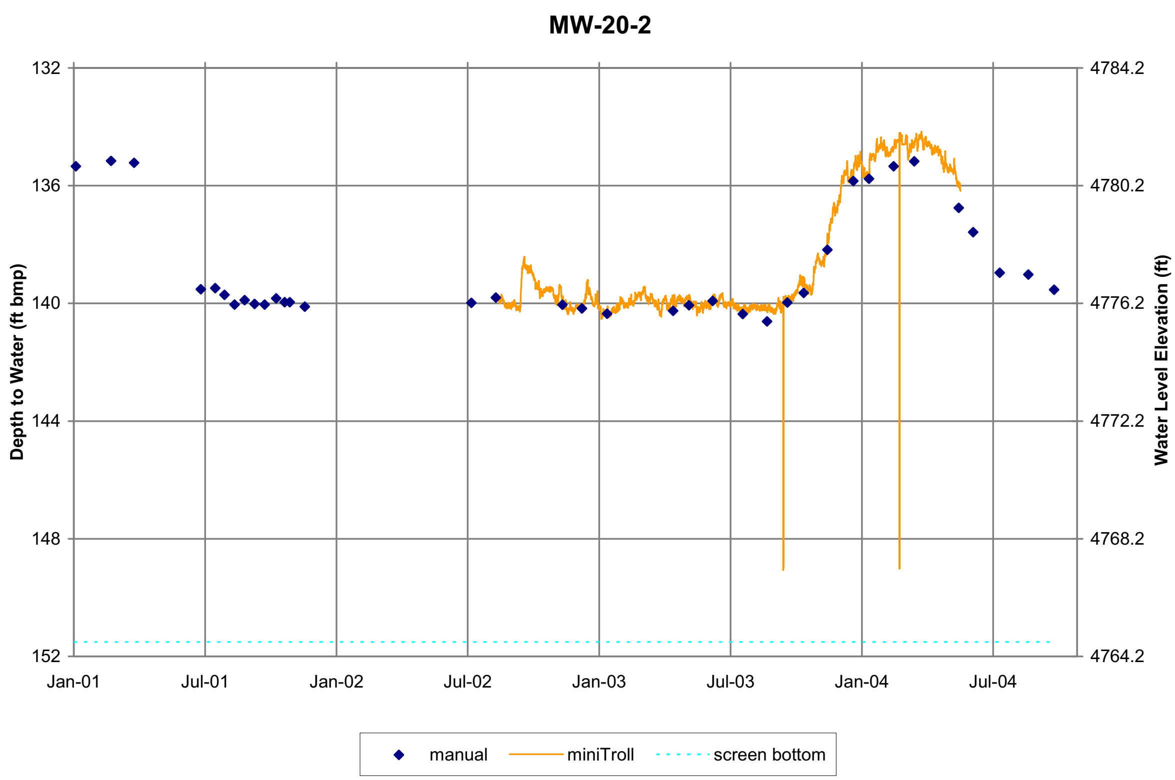
Response of Wells MW-6 and 33-3 to 1 M gal Potable Water Leak at CPP-1673

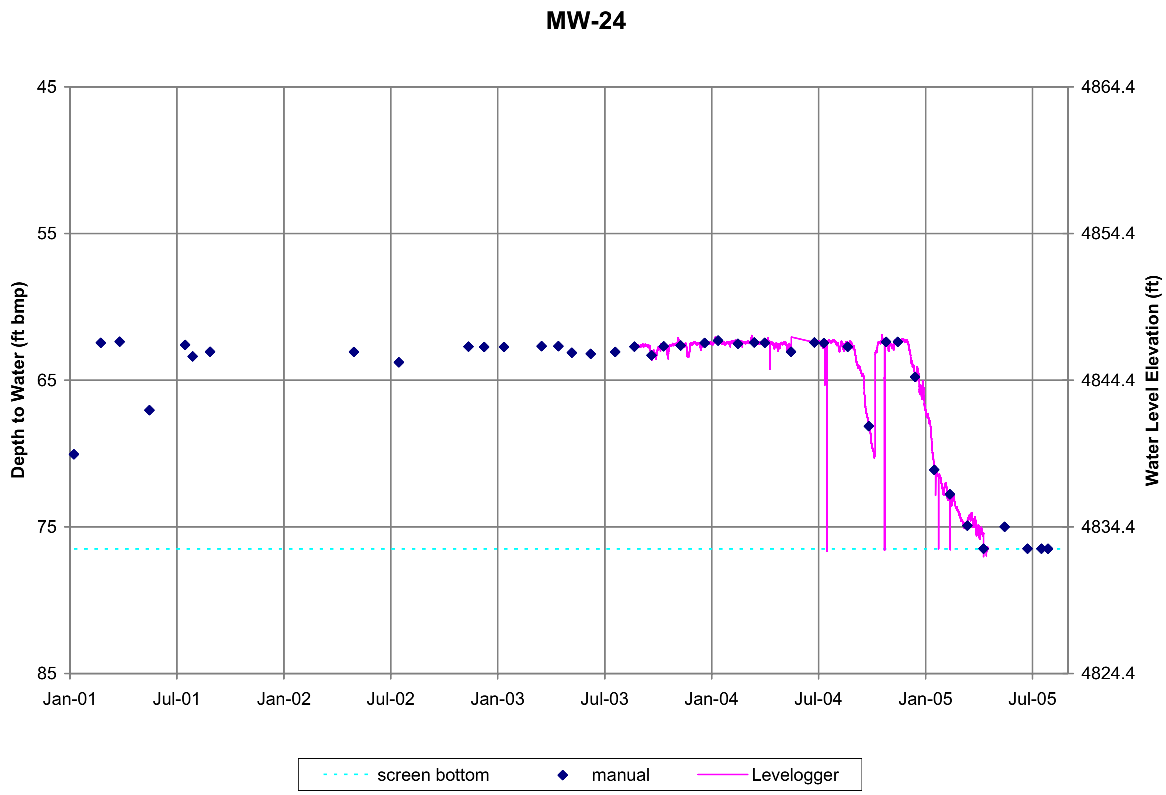


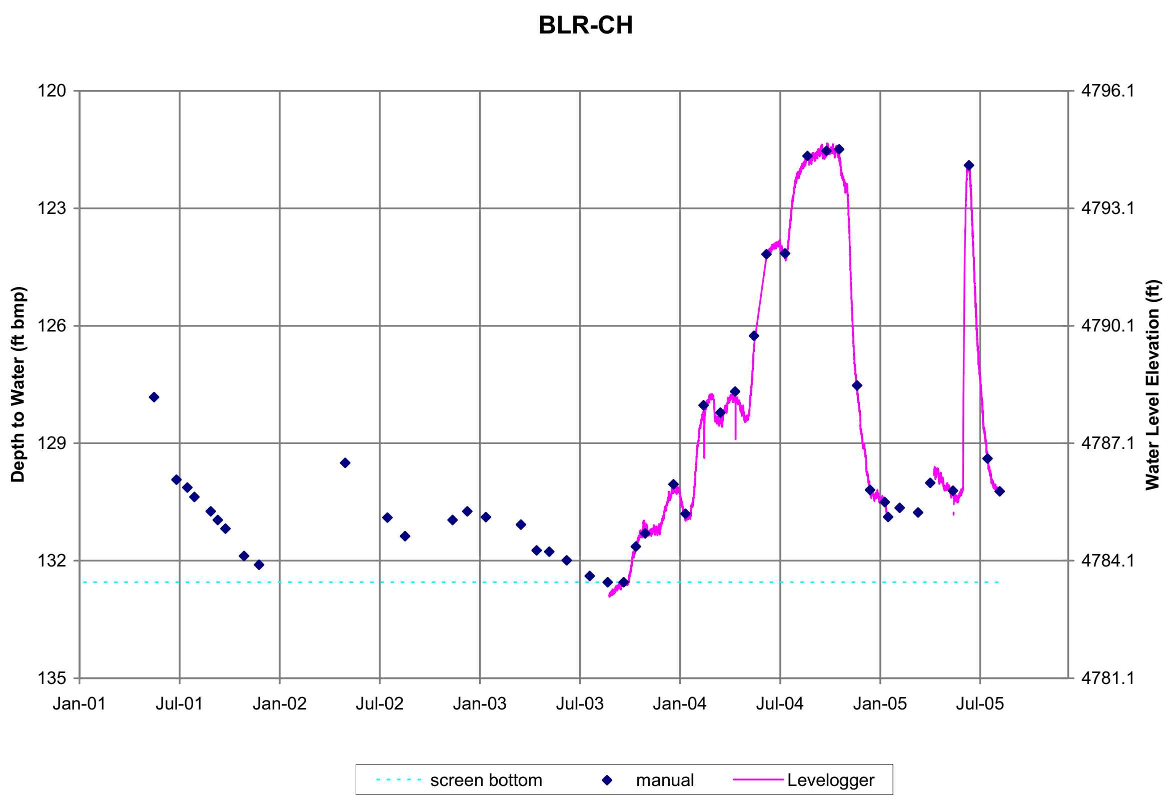
MW-7-2

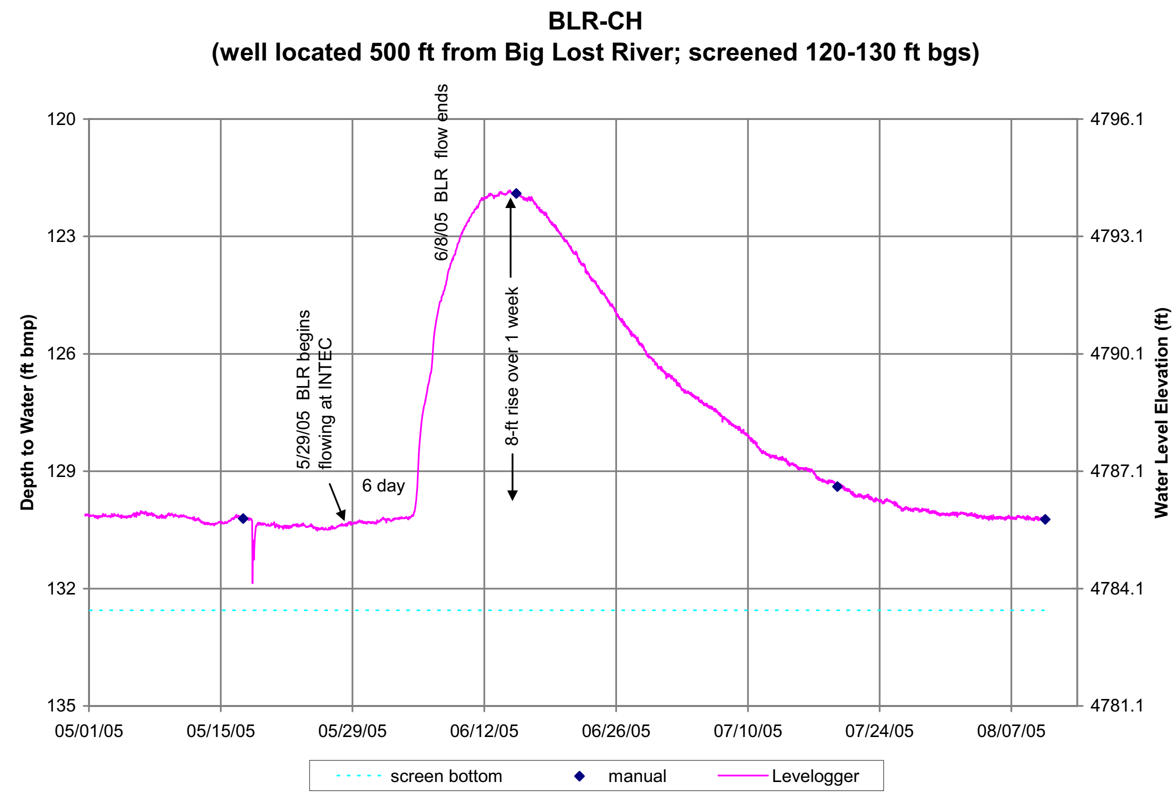


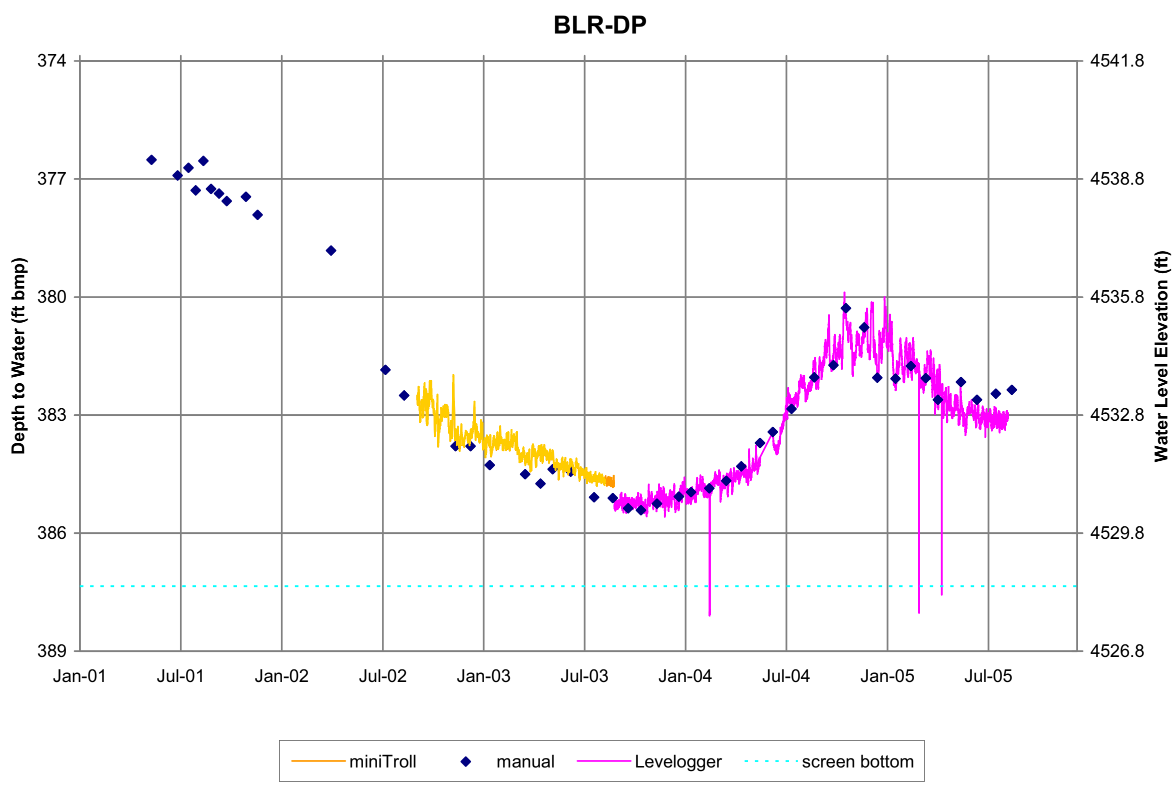

MW-10-2
Depth to Water (ft bmp)
Water Level Elevation (ft)
145
147
149
151
153
155
4772
4770
4768
4766
4764
4762
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
manual
miniTroll
Levelogger
screen bottom

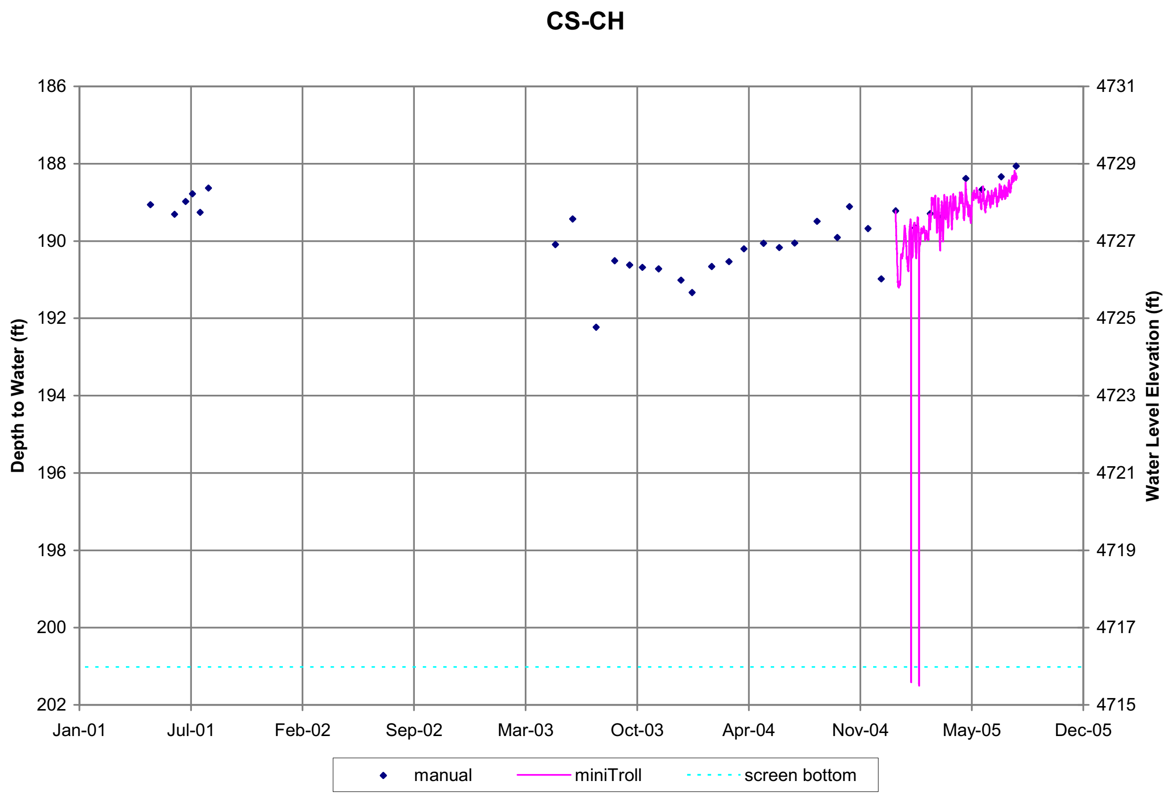

MW-20-2
Depth to Water (ft bmp)
Water Level Elevation (ft)
132
136
140
144
148
152
4784.2
4780.2
4776.2
4772.2
4768.2
4764.2
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
manual
miniTroll
screen bottom


MW-24
45
55
65
75
85
4864.4
4854.4
4844.4
4834.4
4824.4
Depth to Water (ft bmp)
Water Level Elevation (ft)
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
screen bottom
manual
Levelogger

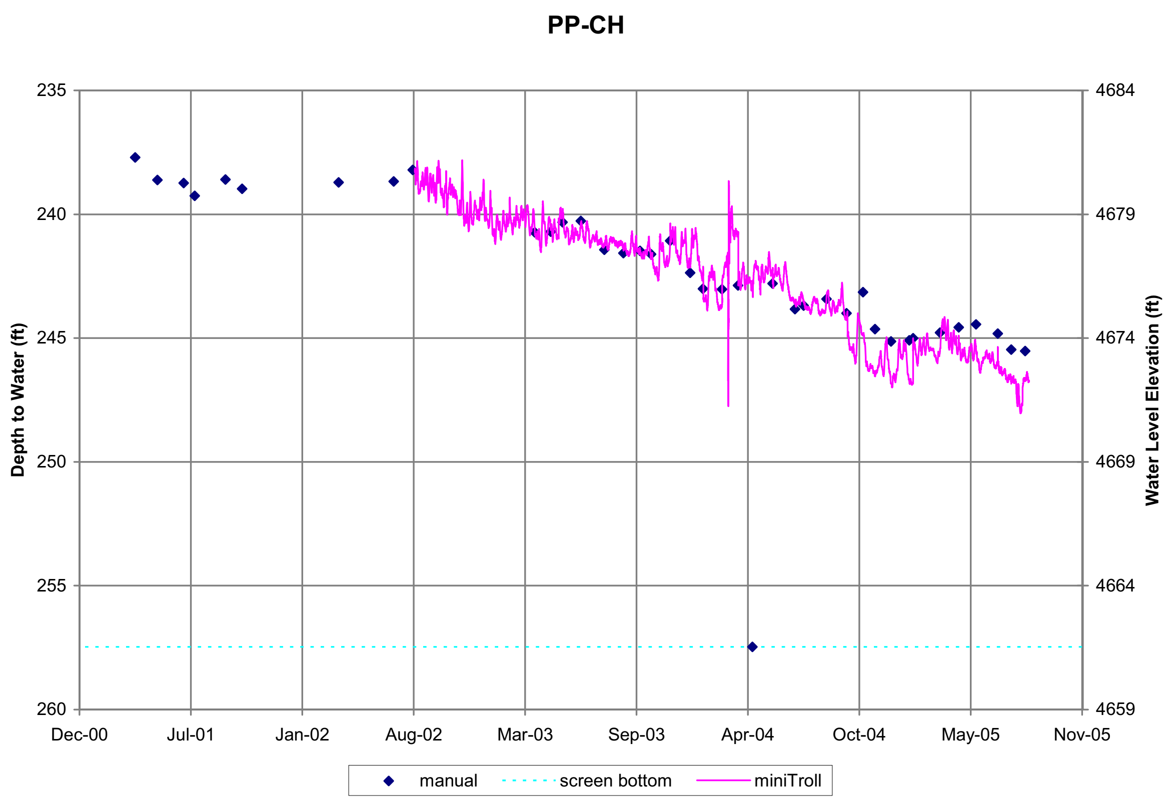

BLR-CH
120
123
126
129
132
135
4796.1
4793.1
4790.1
4787.1
4784.1
4781.1
Depth to Water (ft bmp)
Water Level Elevation (ft)
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
screen bottom
manual
Levelogger


BLR-CH
(well located 500 ft from Big Lost River; screened 120-130 ft bgs)
Depth to Water (ft bmp)
Water Level Elevation (ft)
120
123
126
129
132
135
4796.1
4793.1
4790.1
4787.1
4784.1
4781.1
05/01/05
05/15/05
05/29/05
06/12/05
06/26/05
07/10/05
07/24/05
08/07/05
6/8/05 BLR flow ends
5/29/05 BLR begins flowing at INTEC
6 day
8-ft rise over 1 week
screen bottom
manual
Levelogger

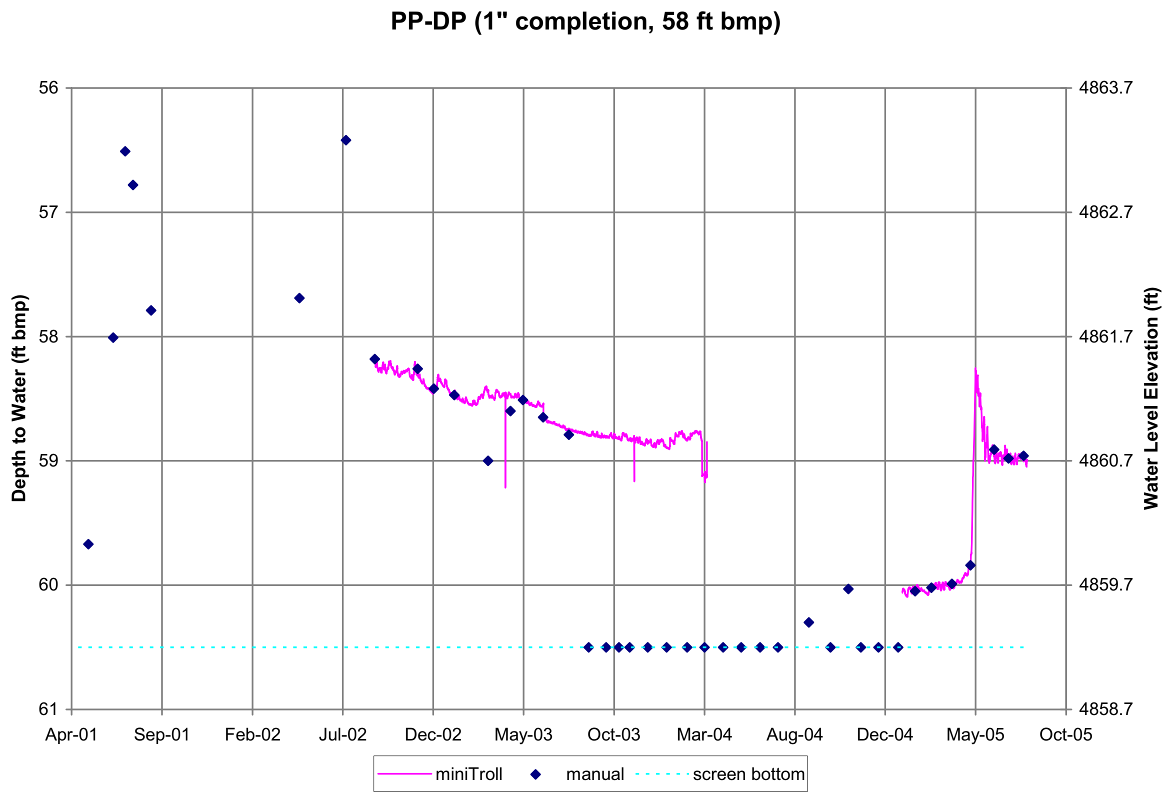

BLR-DP
Depth to Water (ft bmp)
Water Level Elevation (ft)
374
377
380
383
386
389
4541.8
4538.8
4535.8
4532.8
4529.8
4526.8
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
miniTroll
manual
Levelogger
screen bottom

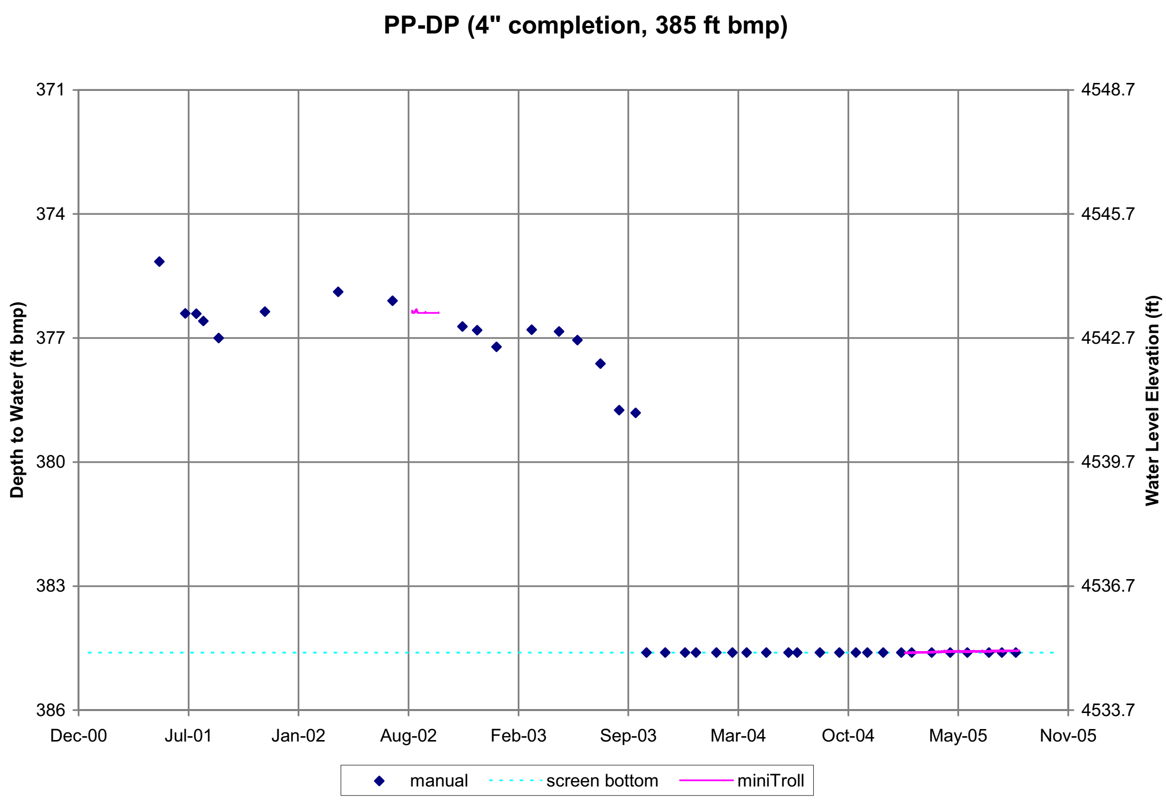


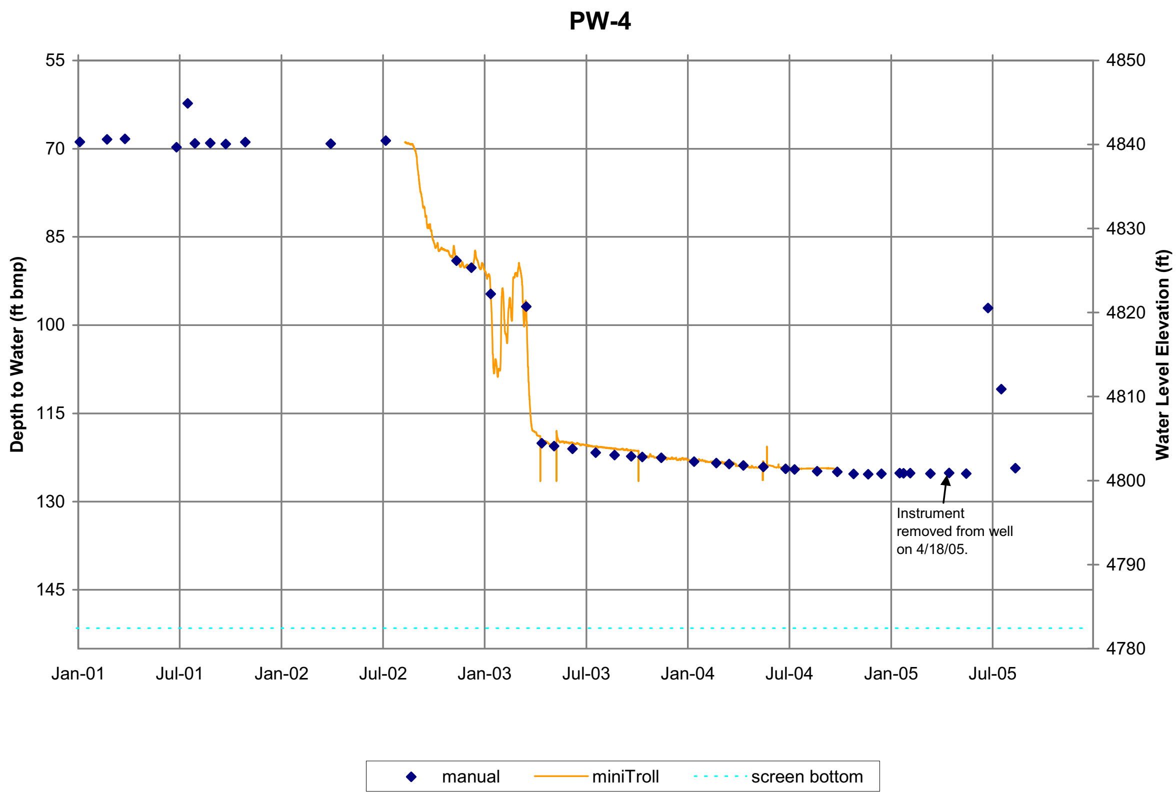
CS-CH
186
188
190
192
194
196
198
200
202
4731
4729
4727
4725
4723
4721
4719
4717
4715
Depth to Water (ft)
Water Level Elevation (ft)
Jan-01
Jul-01
Feb-02
Sep-02
Mar-03
Oct-03
Apr-04
Nov-04
May-05
Dec-05
manual
miniTroll
screen bottom

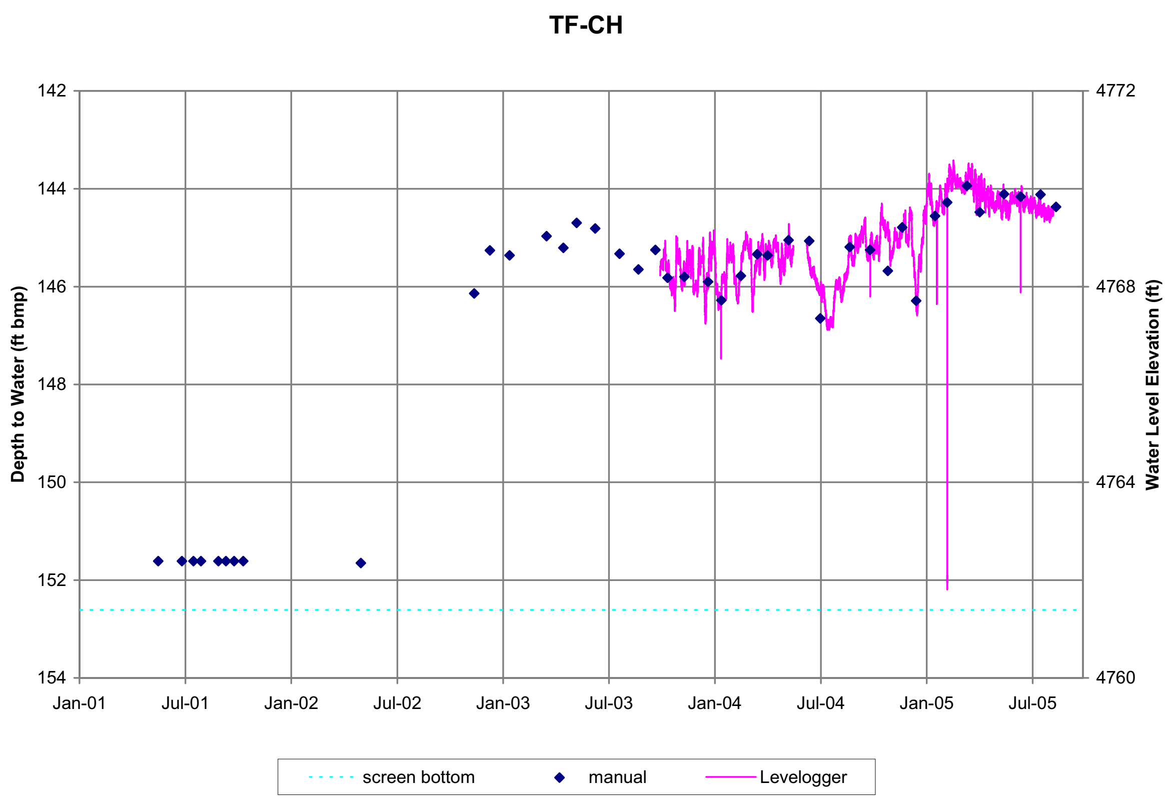


PP-CH
235
240
245
250
255
260
4684
4679
4674
4669
4664
4659
Depth to Water (ft)
Water Level Elevation (ft)
Dec-00
Jul-01
Jan-02
Aug-02
Mar-03
Sep-03
Apr-04
Oct-04
May-05
Nov-05
manual
screen bottom
miniTroll

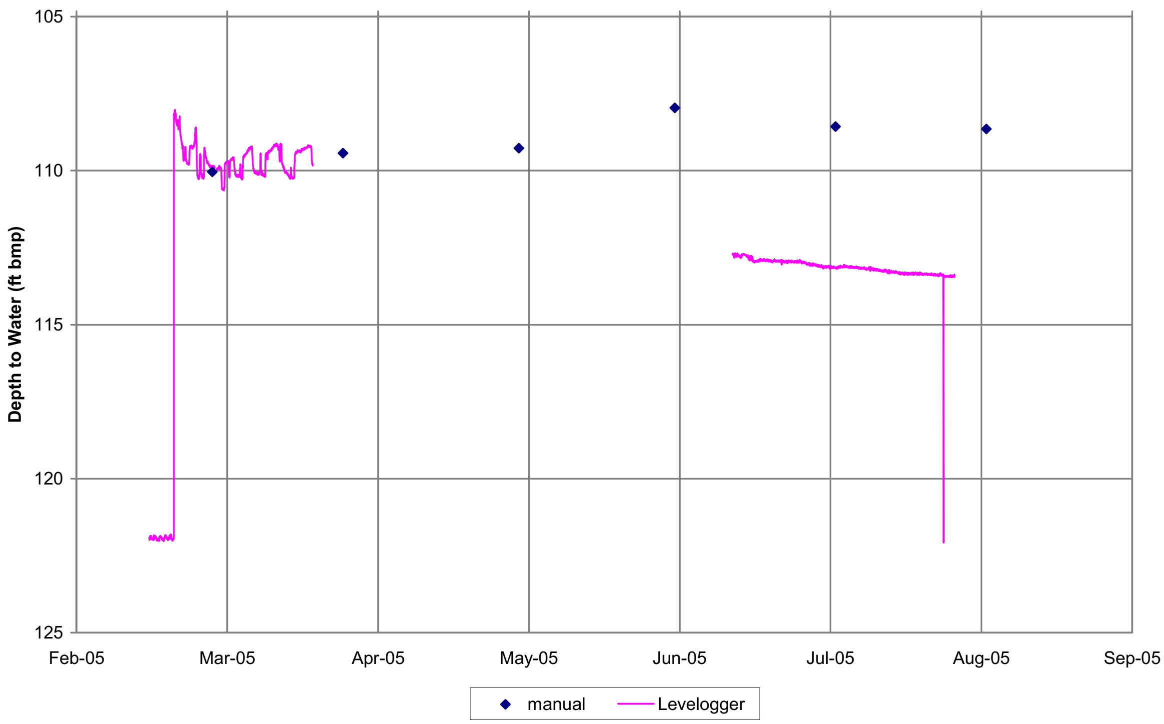

PP-DP (1" completion, 58 ft bmp)
Depth to Water (ft bmp)
Water Level Elevation (ft)
56
57
58
59
60
61
4863.7
4862.7
4861.7
4860.7
4859.7
4858.7
Apr-01
Sep-01
Feb-02
Jul-02
Dec-02
May-03
Oct-03
Mar-04
Aug-04
Dec-04
May-05
Oct-05
miniTroll
manual
screen bottom


PP-DP (4" completion, 385 ft bmp)
Depth to Water (ft bmp)
Water Level Elevation (ft)
371
374
377
380
383
386
4548.7
4545.7
4542.7
4539.7
4536.7
4533.7
Dec-00
Jul-01
Jan-02
Aug-02
Feb-03
Sep-03
Mar-04
Oct-04
May-05
Nov-05
manual
screen bottom
miniTroll


PW-4
Depth to Water (ft bmp)
Water Level Elevation (ft)
55
70
85
100
115
130
145
4850
4840
4830
4820
4810
4800
4790
4780
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
Instrument removed from well on 4/18/05.
manual
miniTroll
screen bottom


TF-CH
Depth to Water (ft bmp)
Water Level Elevation (ft)
142
144
146
148
150
152
154
4772
4768
4764
4760
Jan-01
Jul-01
Jan-02
Jul-02
Jan-03
Jul-03
Jan-04
Jul-04
Jan-05
Jul-05
screen bottom
manual
Levelogger

ICPP-2018



ICPP-2019